

459/498

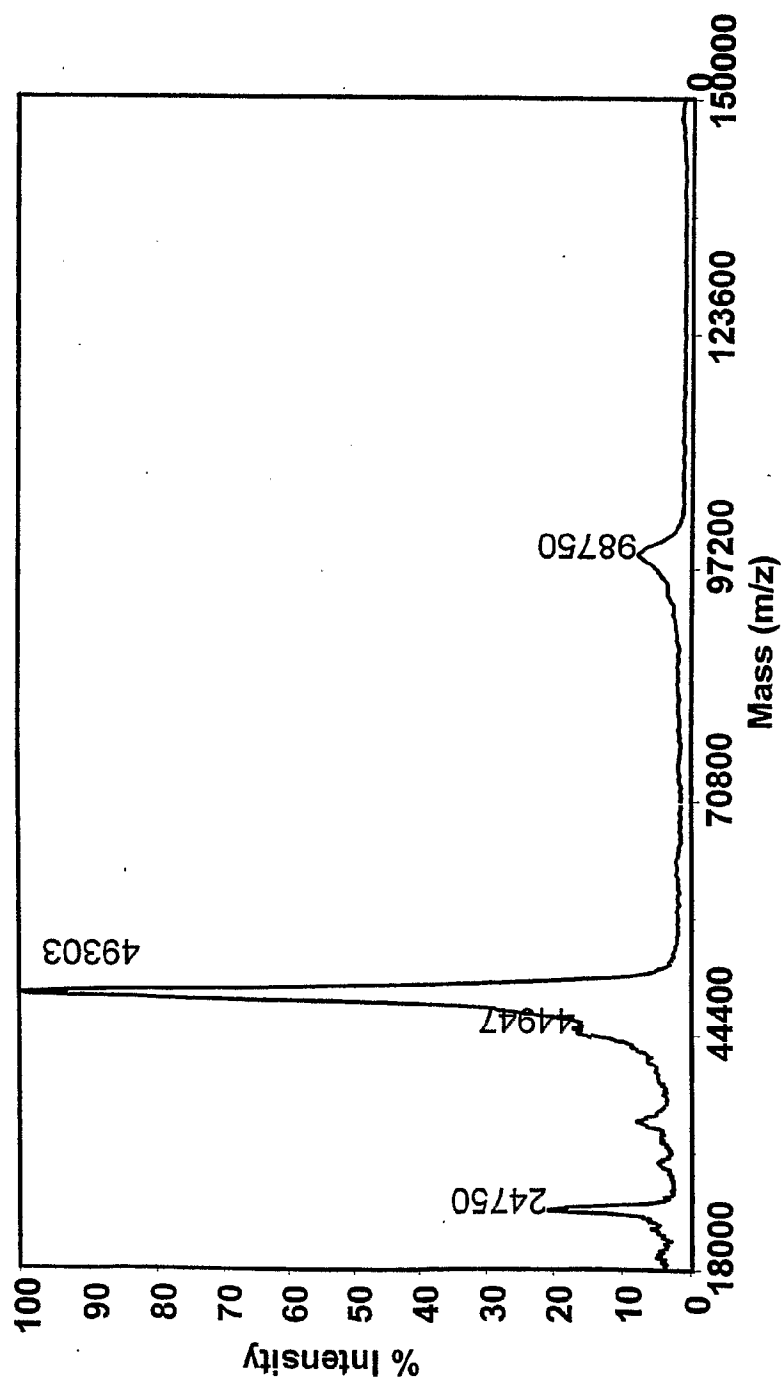


FIG. 158

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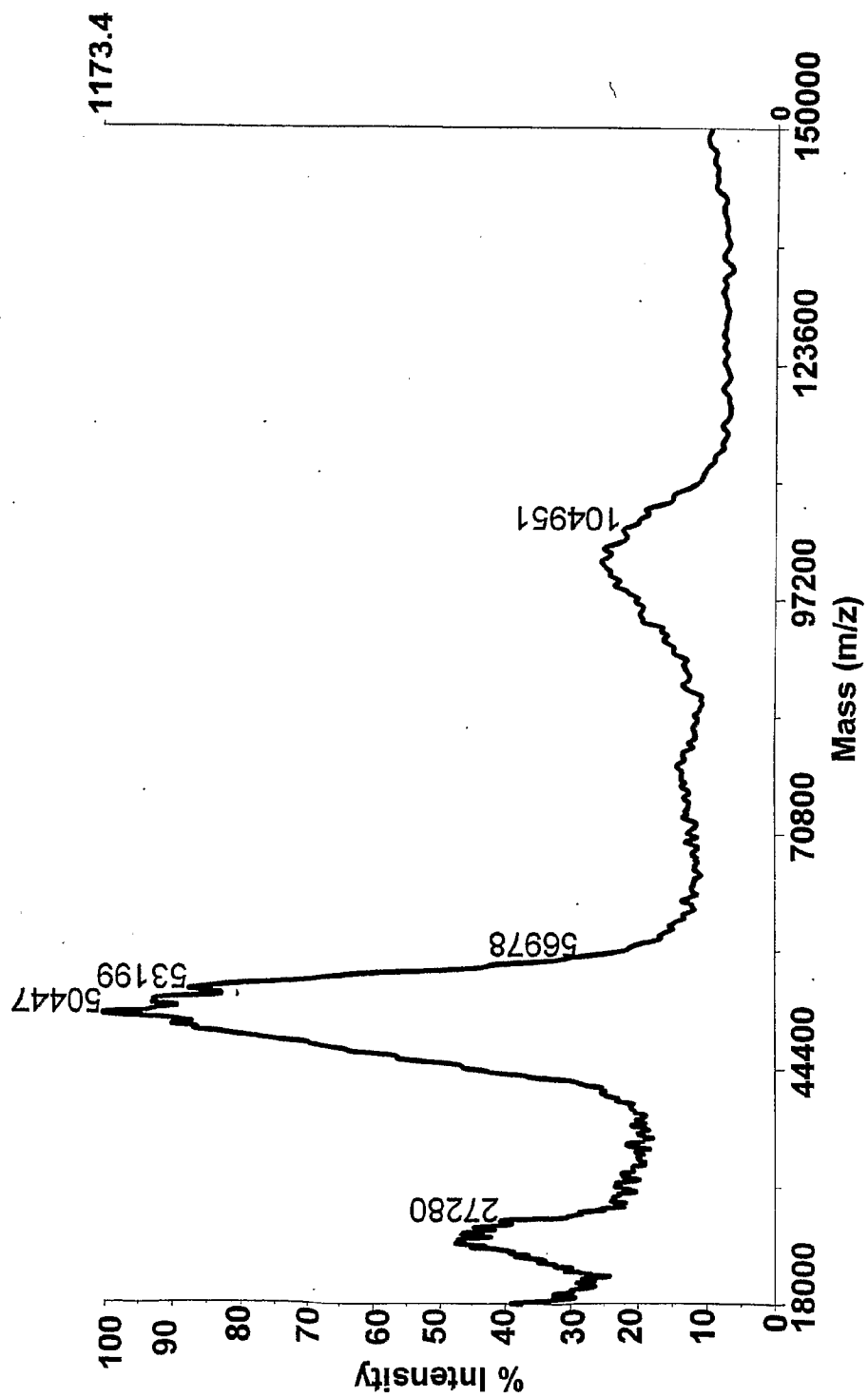


FIG. 159

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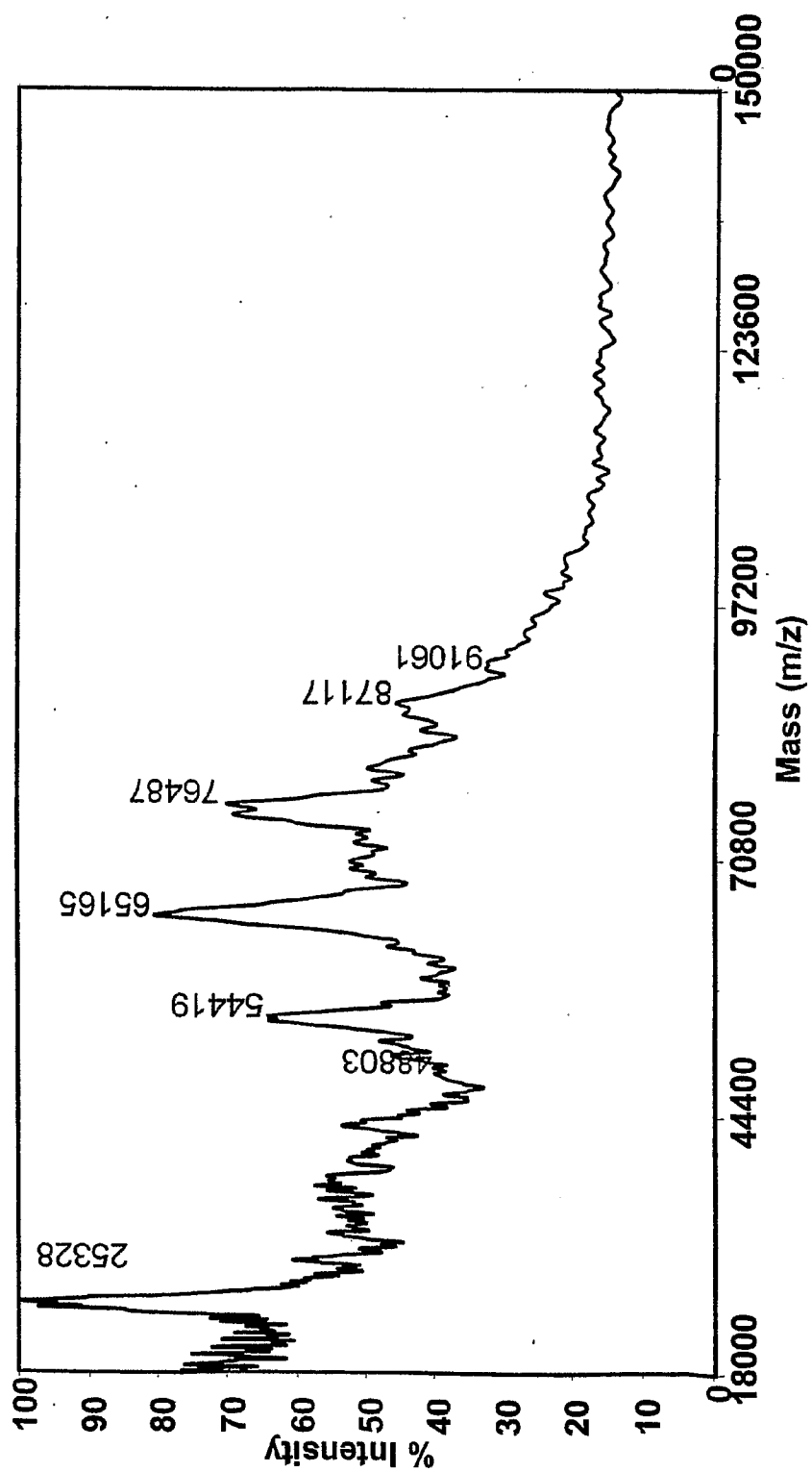


FIG. 160

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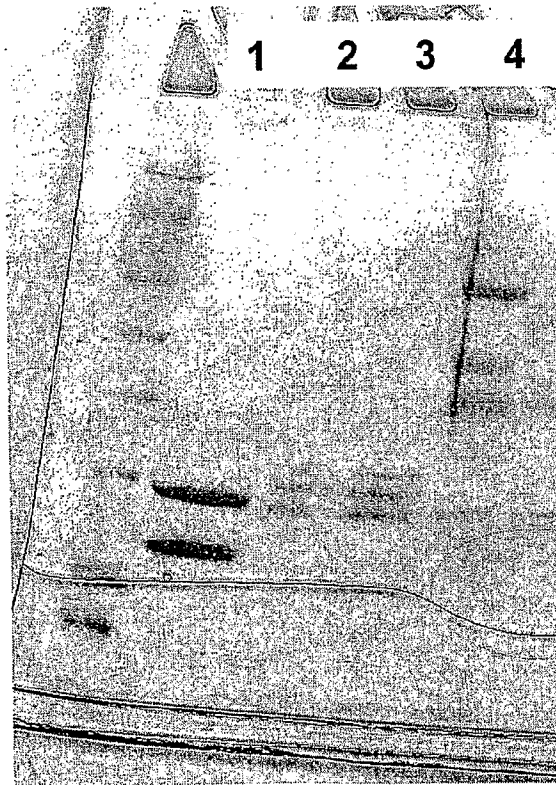


FIG. 161

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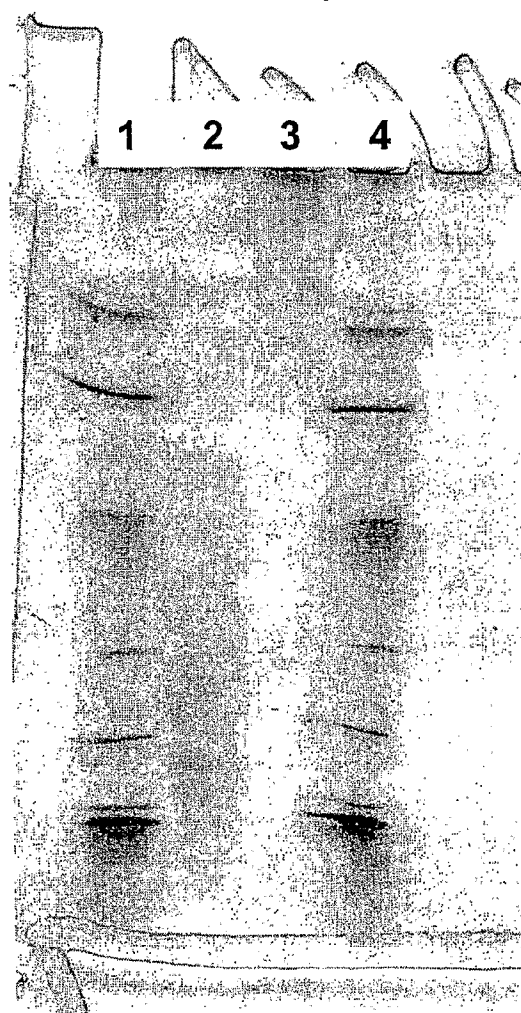


FIG. 162

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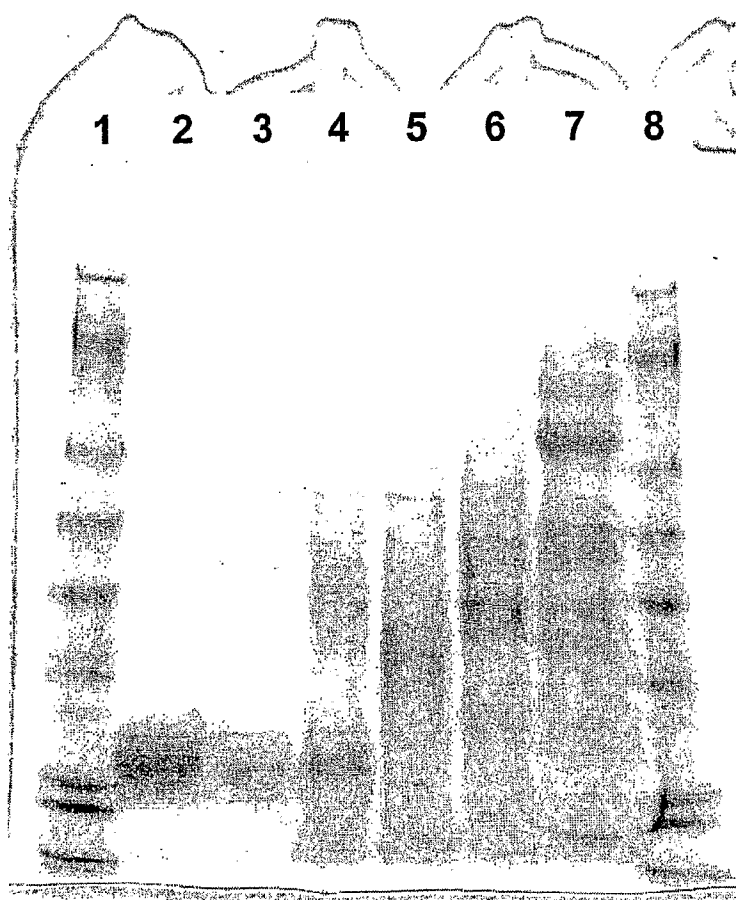


FIG. 163

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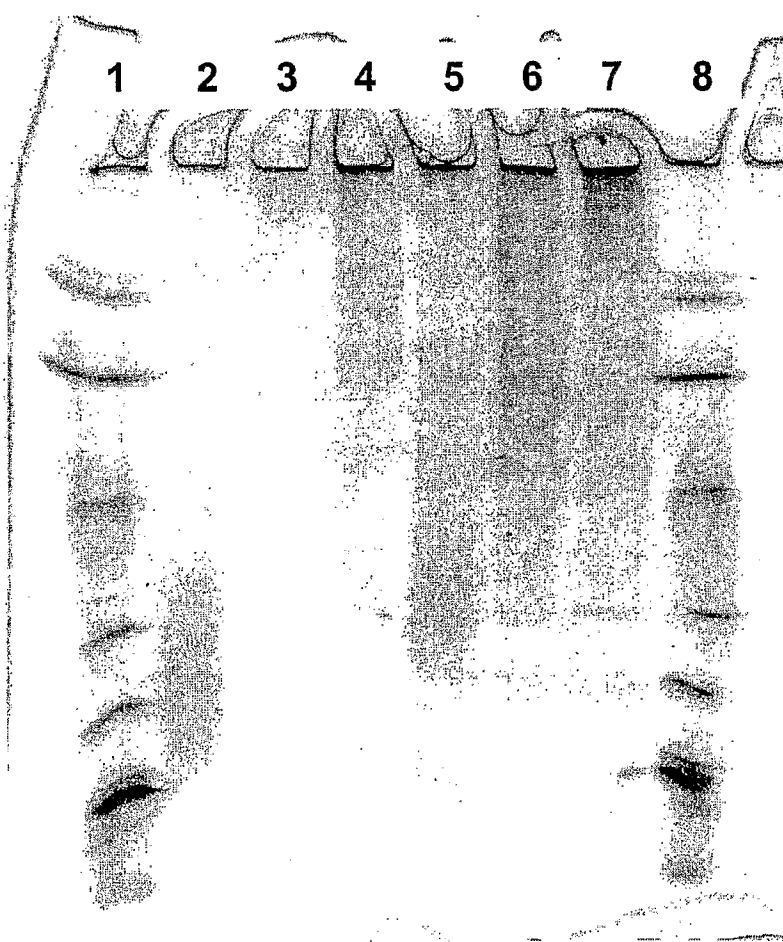


FIG. 164

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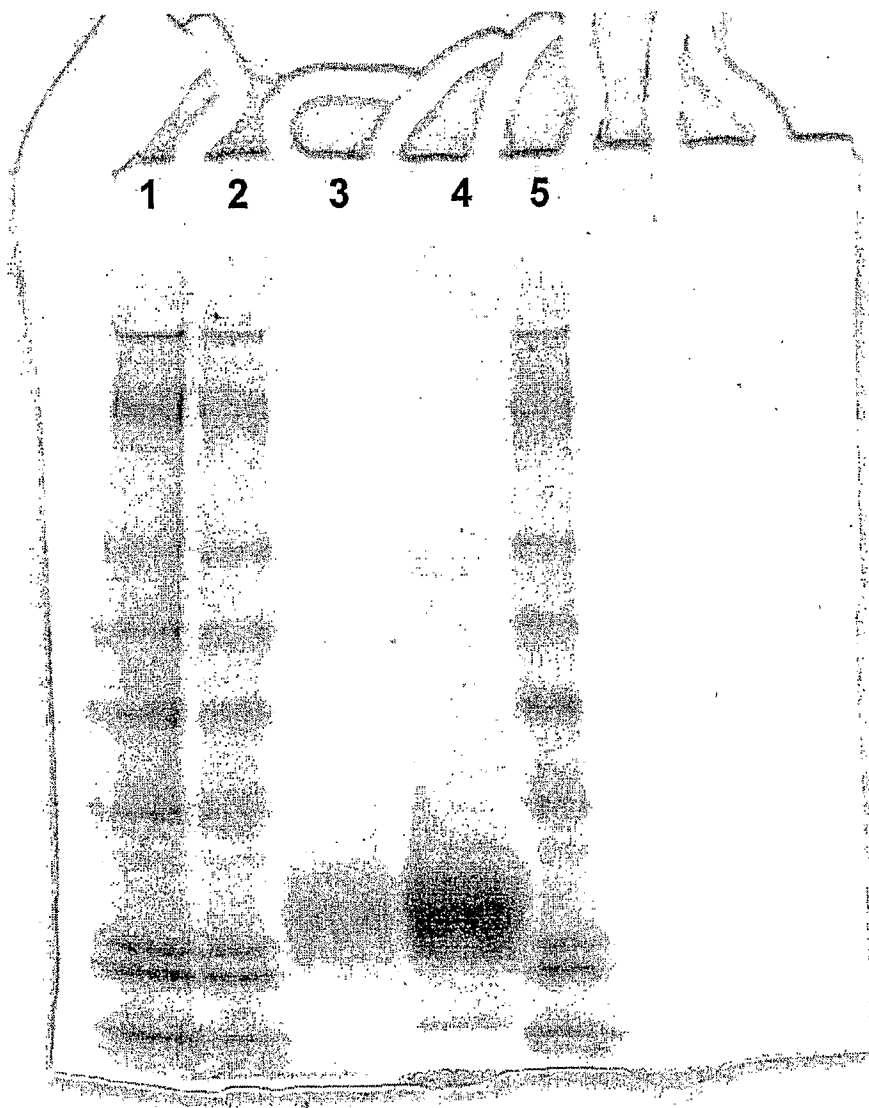


FIG. 165

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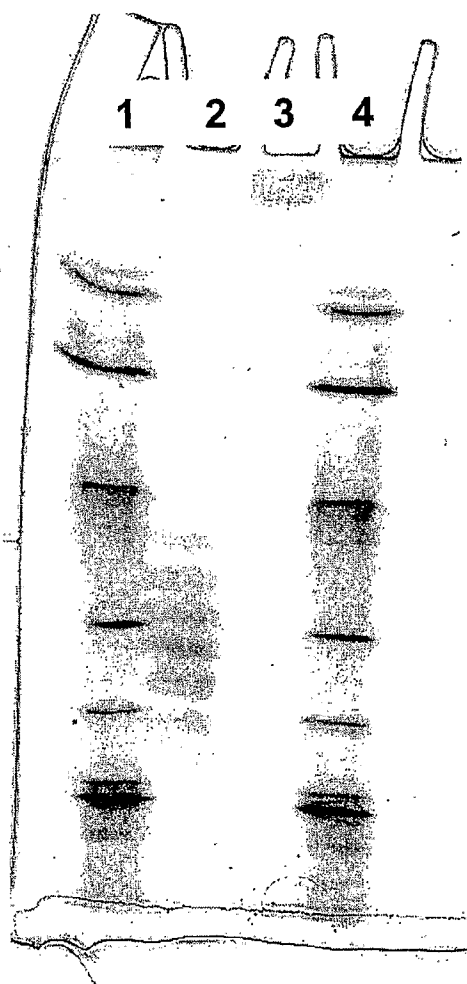


FIG. 166

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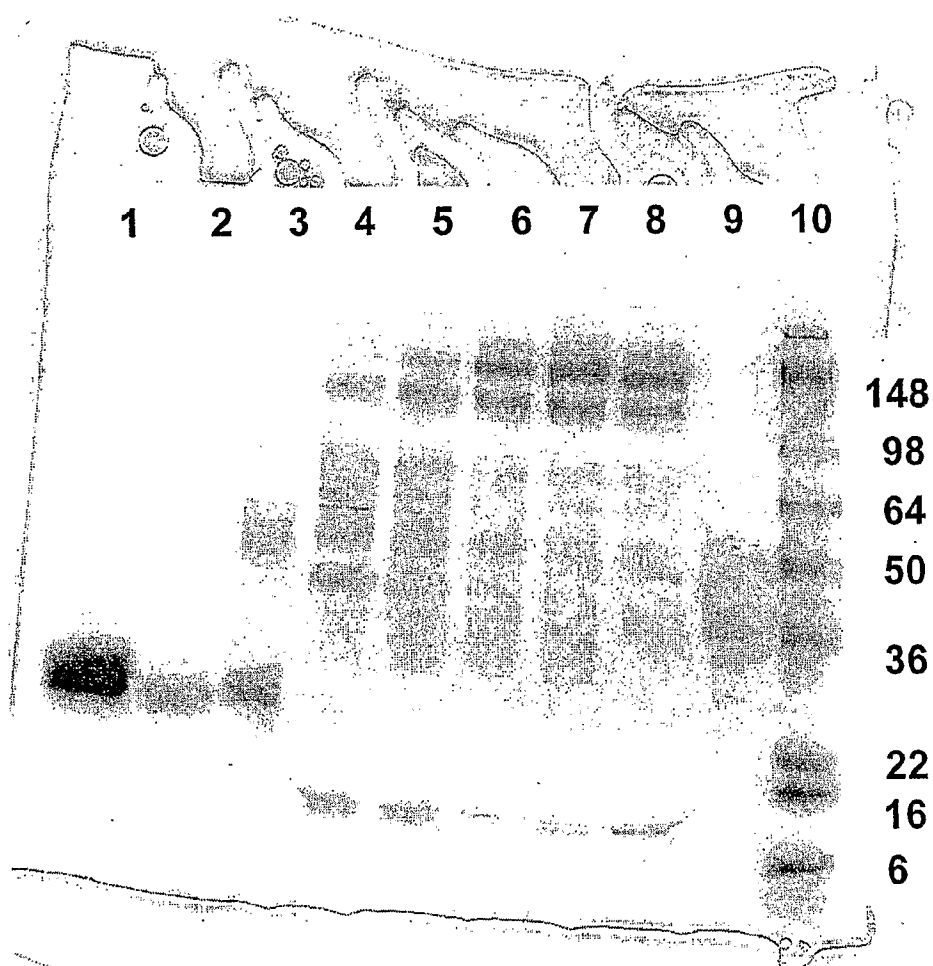


FIG. 167

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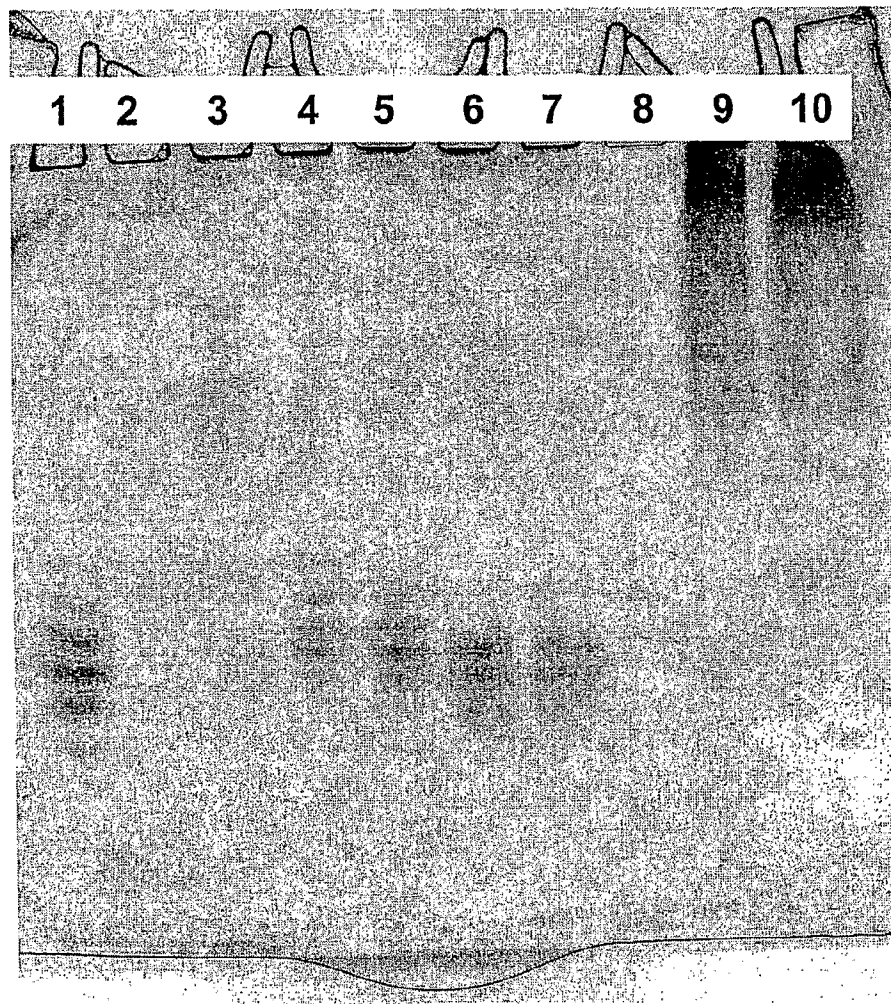


FIG. 168

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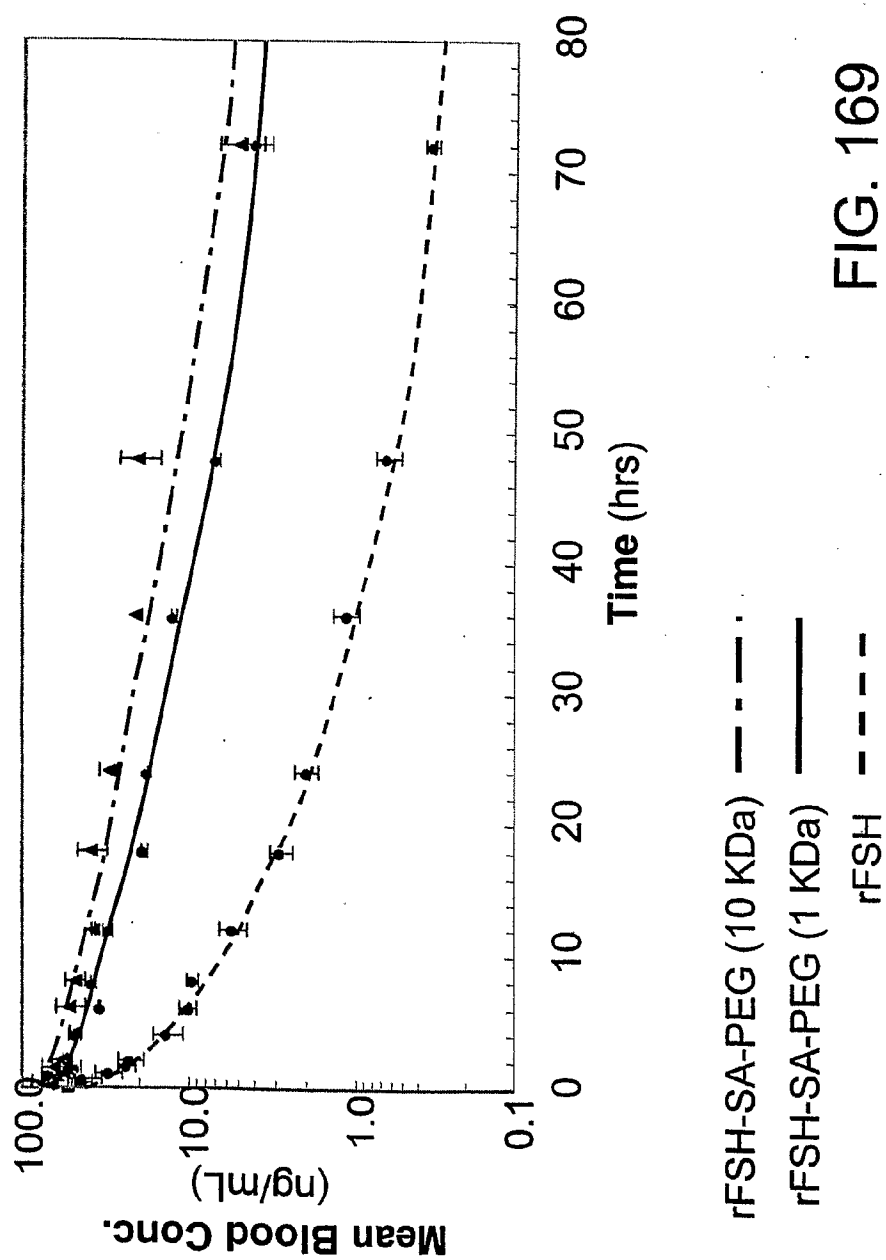


FIG. 169

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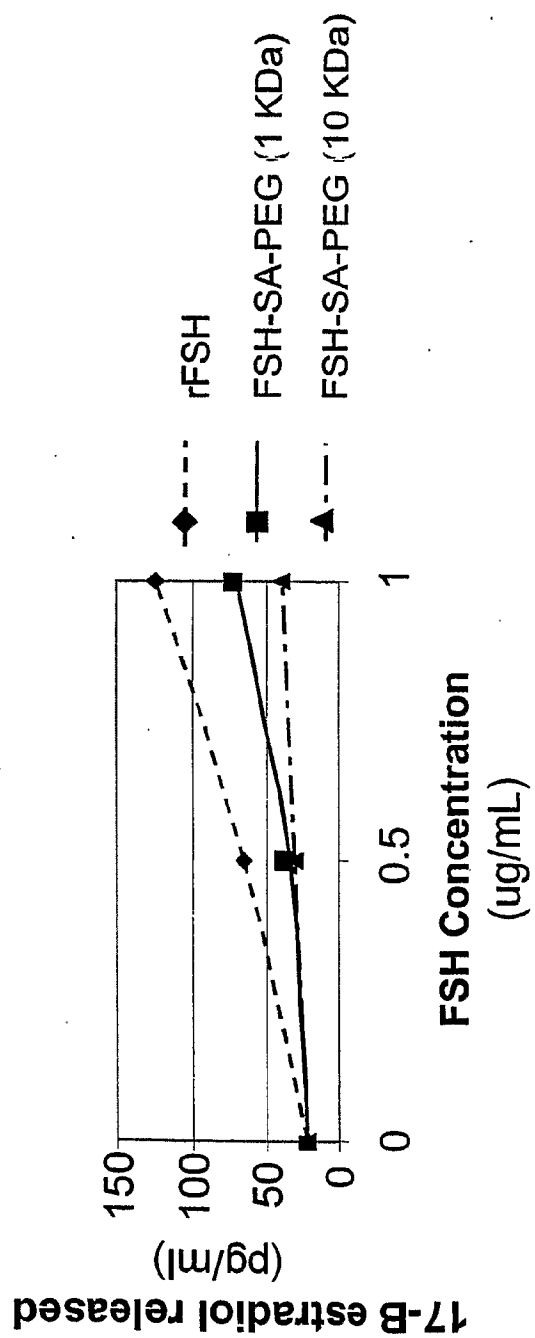


FIG. 170

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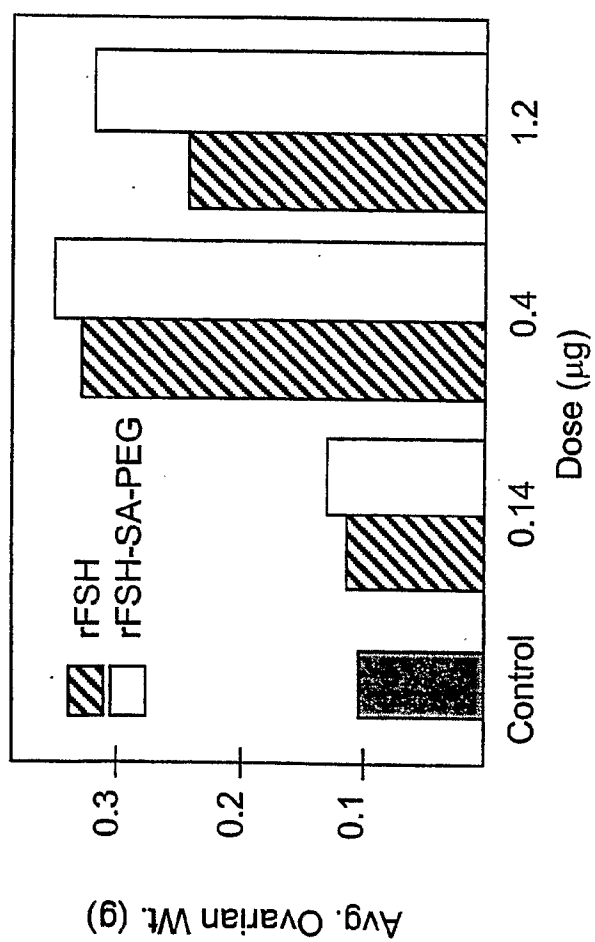


FIG. 171

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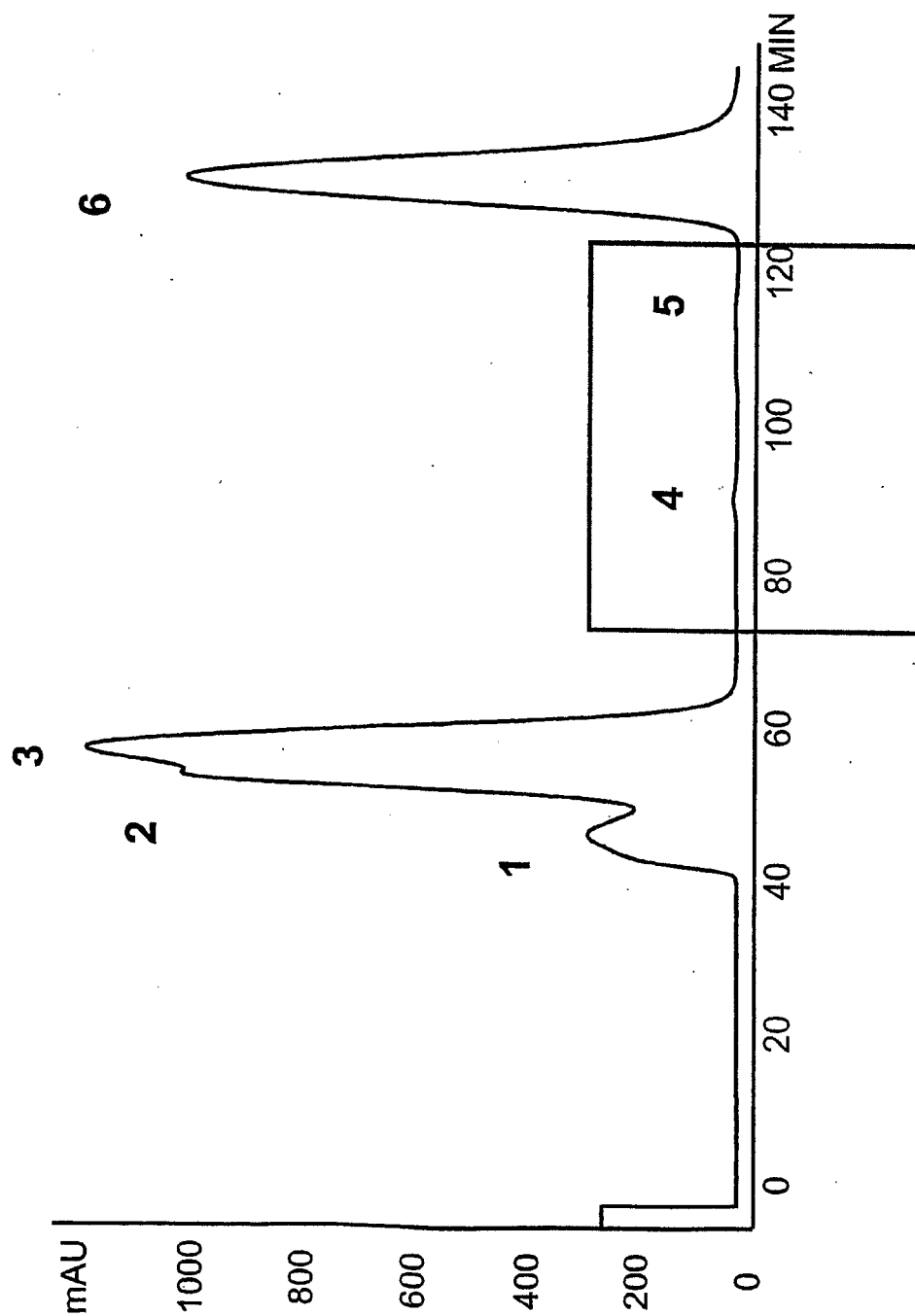


FIG. 172A

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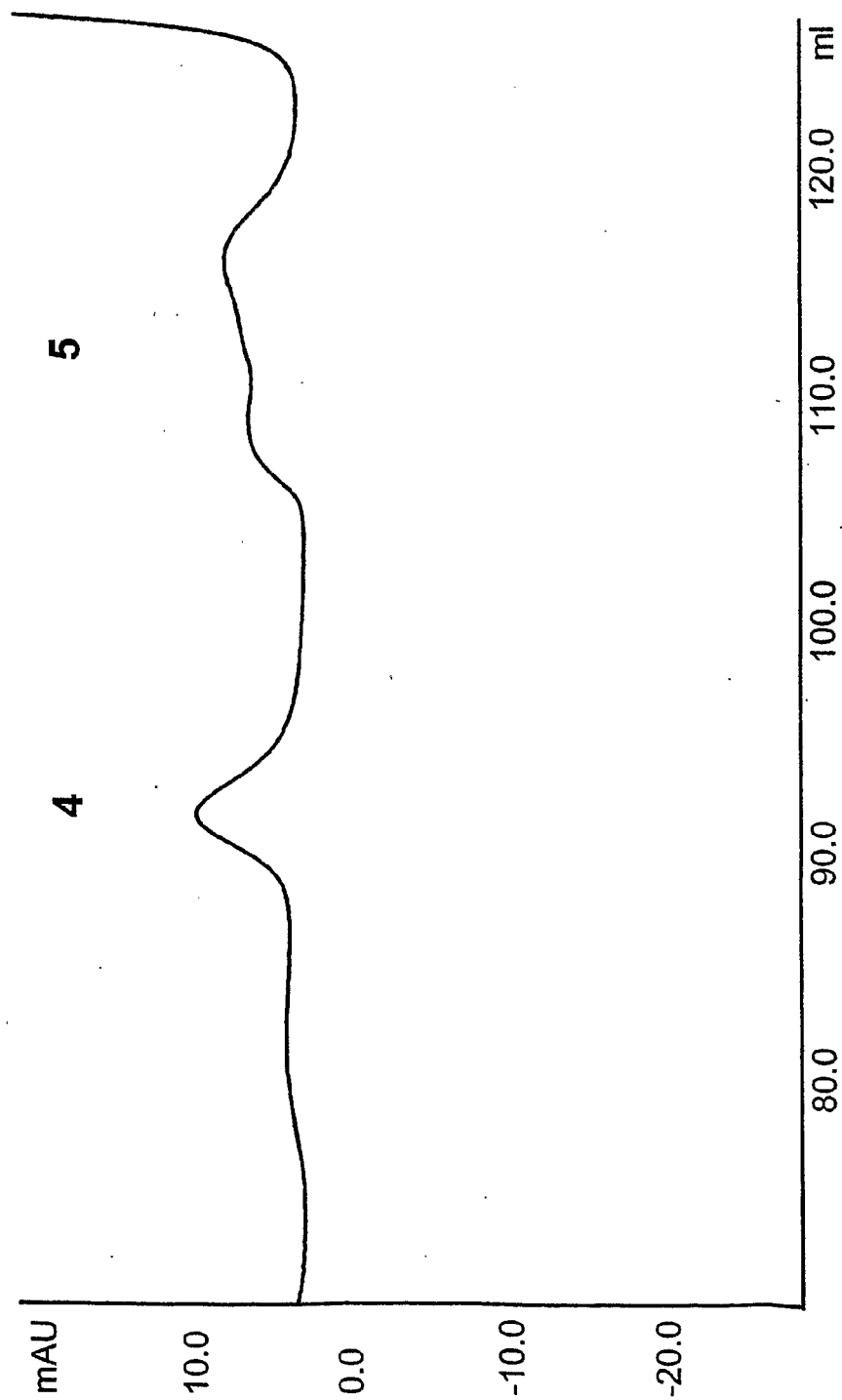


FIG. 172B

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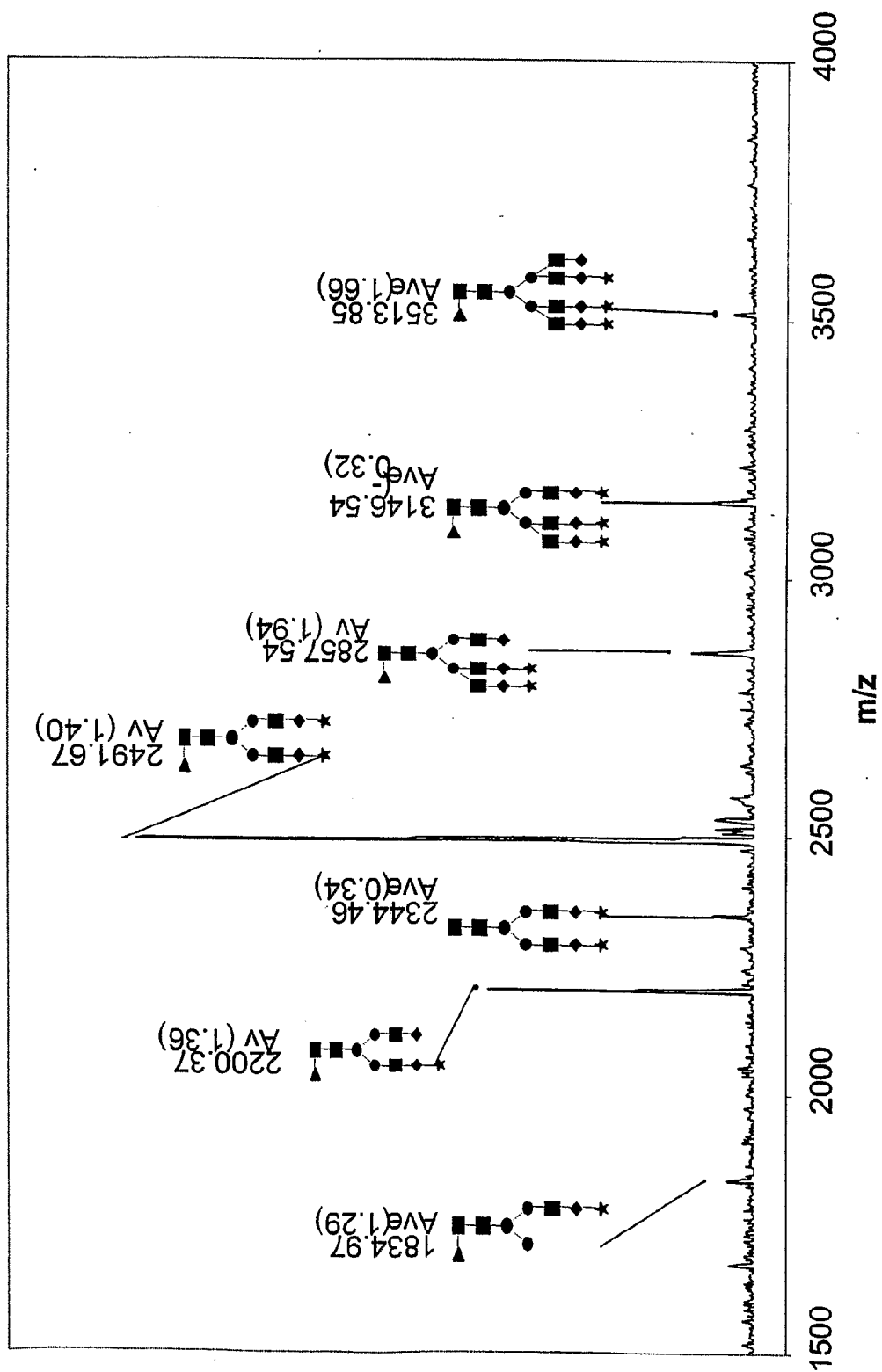


FIG. 173A

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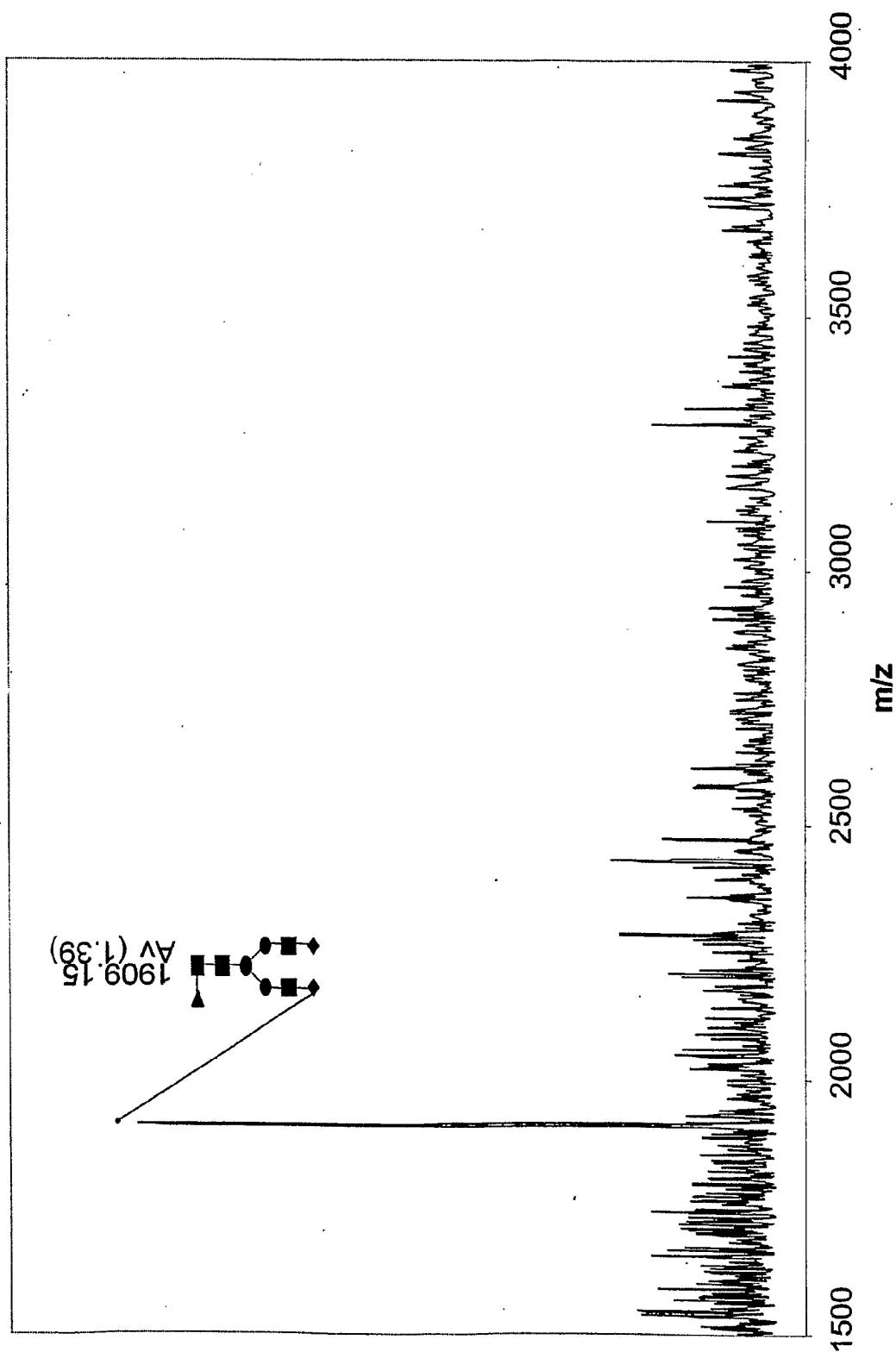


FIG. 173B

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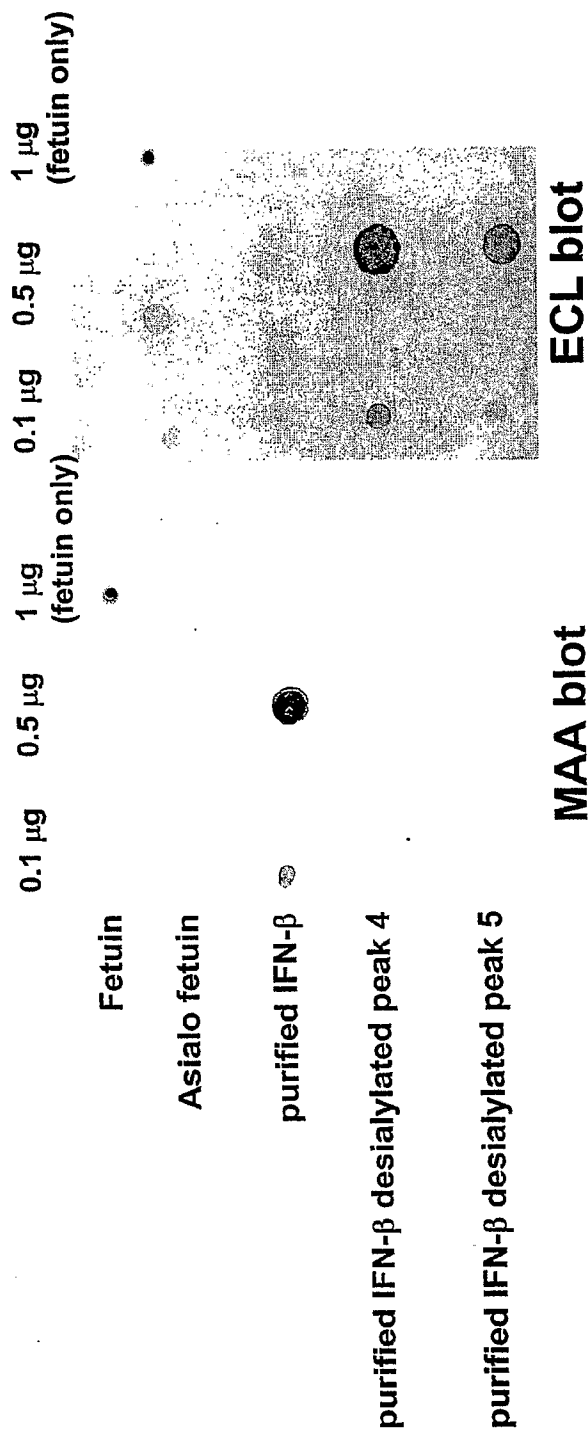


FIG. 174

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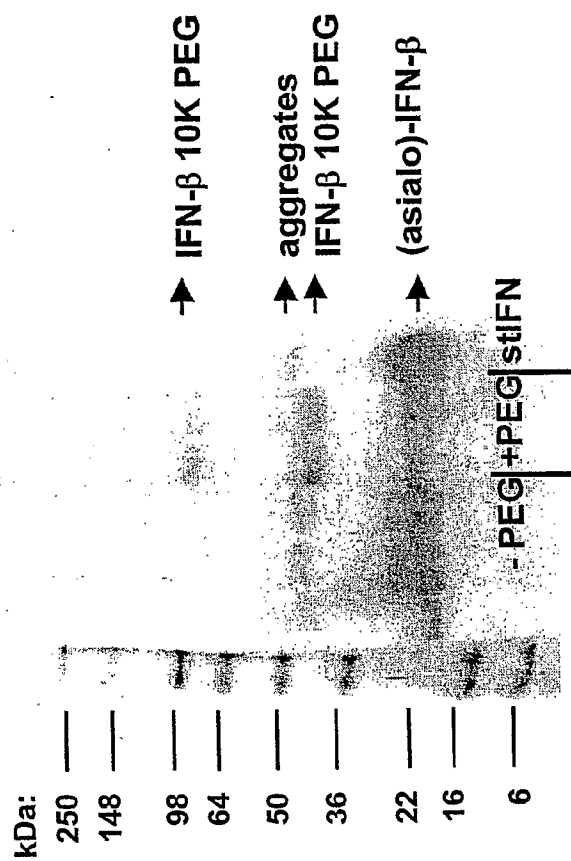


FIG. 175

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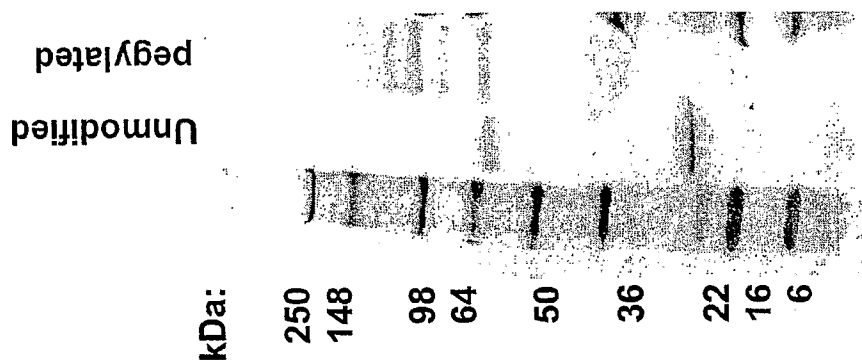


FIG. 176

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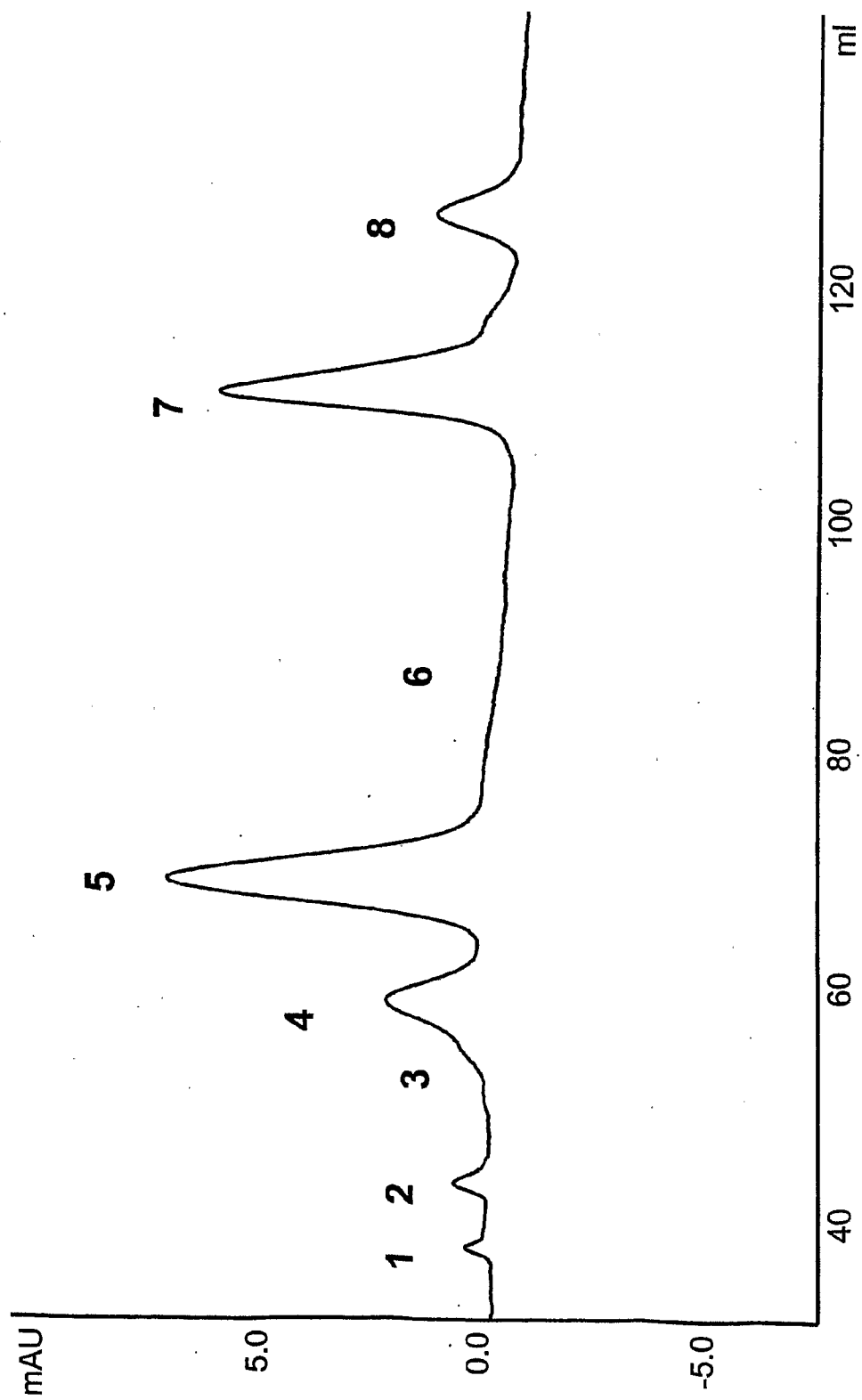


FIG. 177

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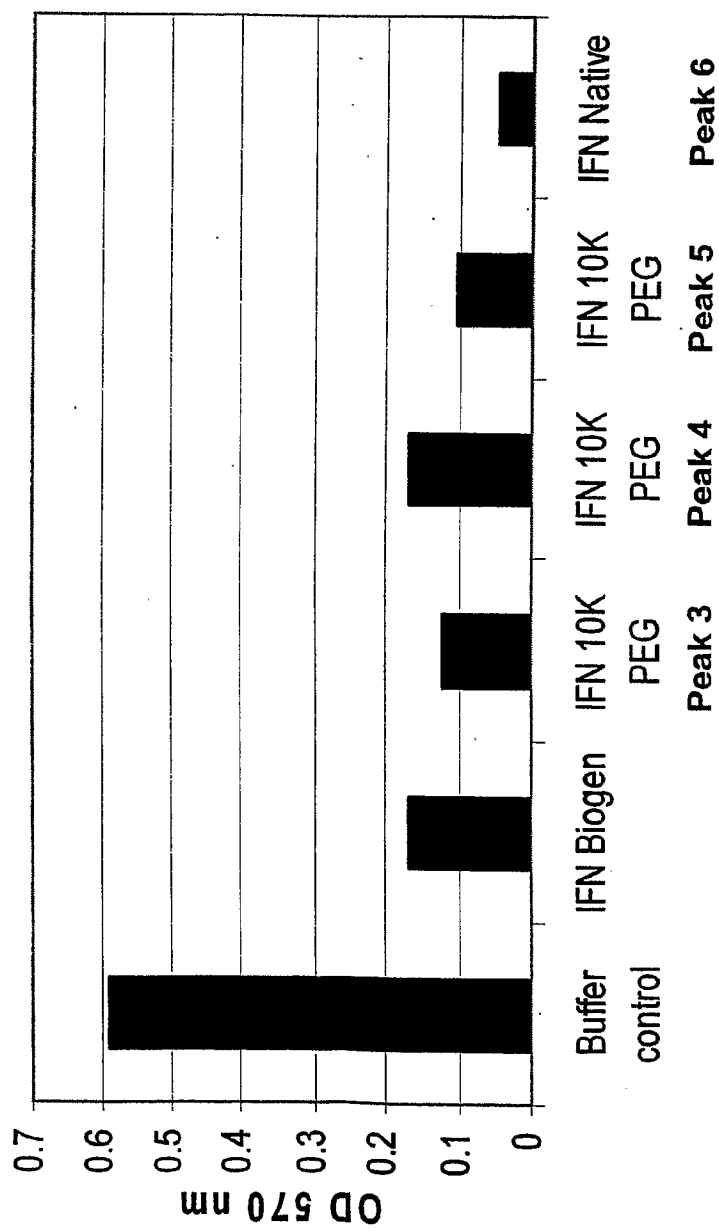


FIG. 178

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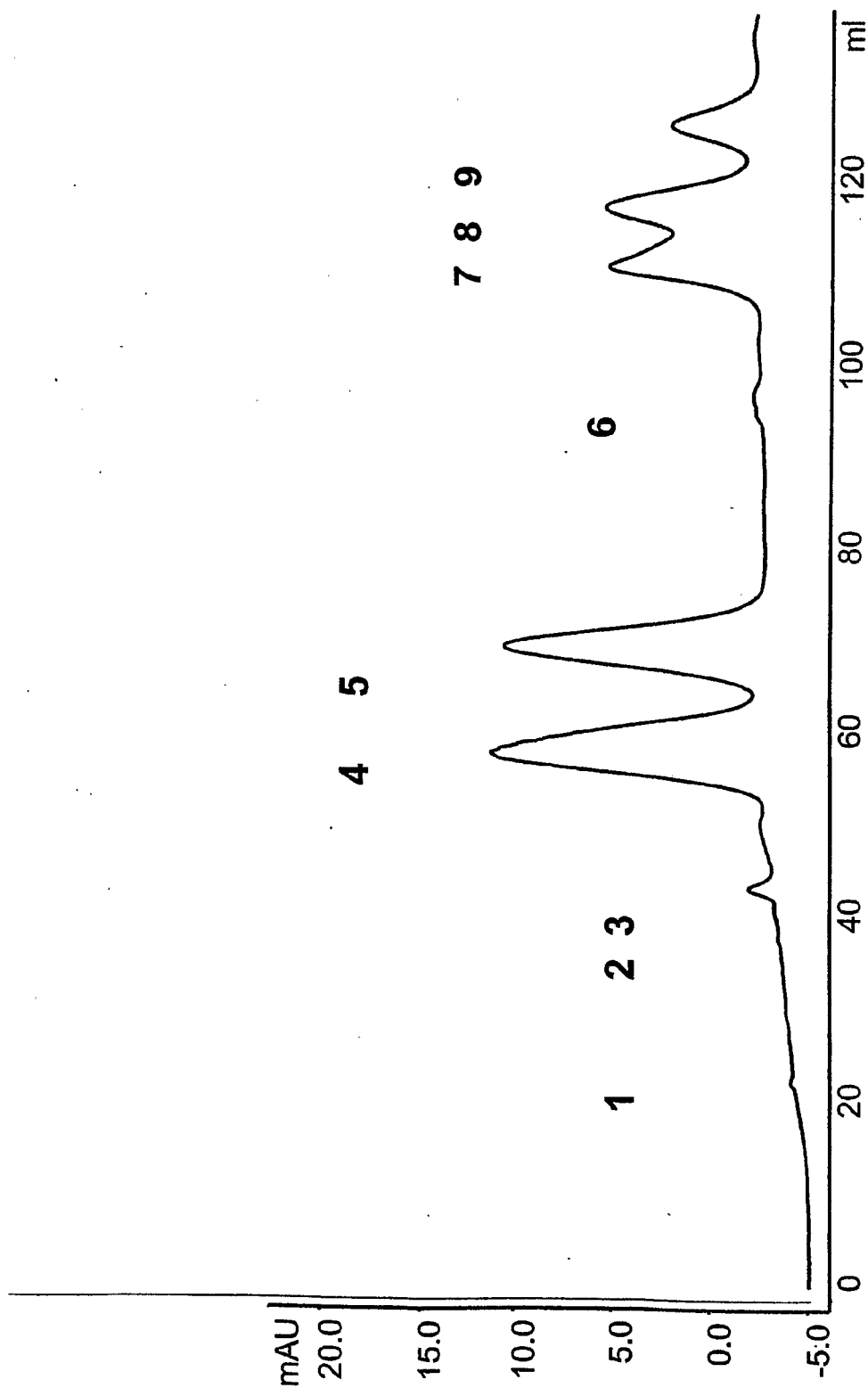


FIG. 179

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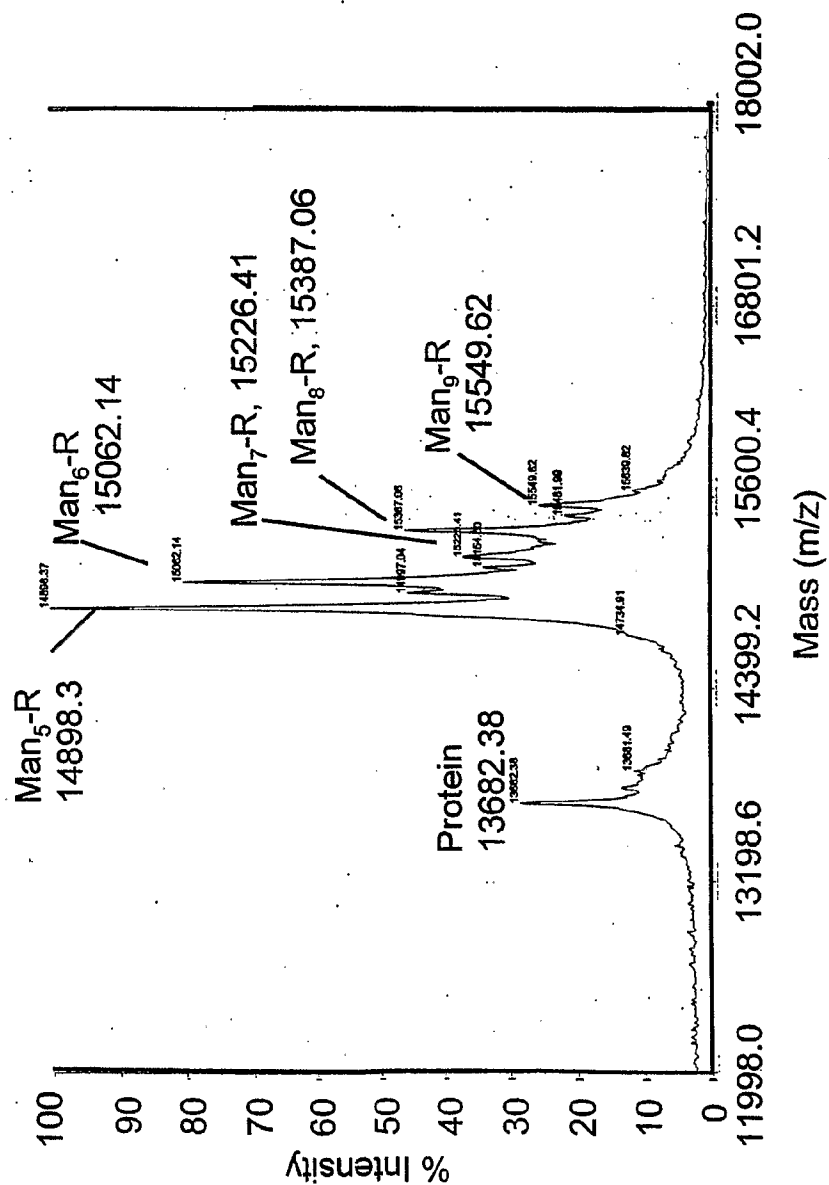


FIG. 180A

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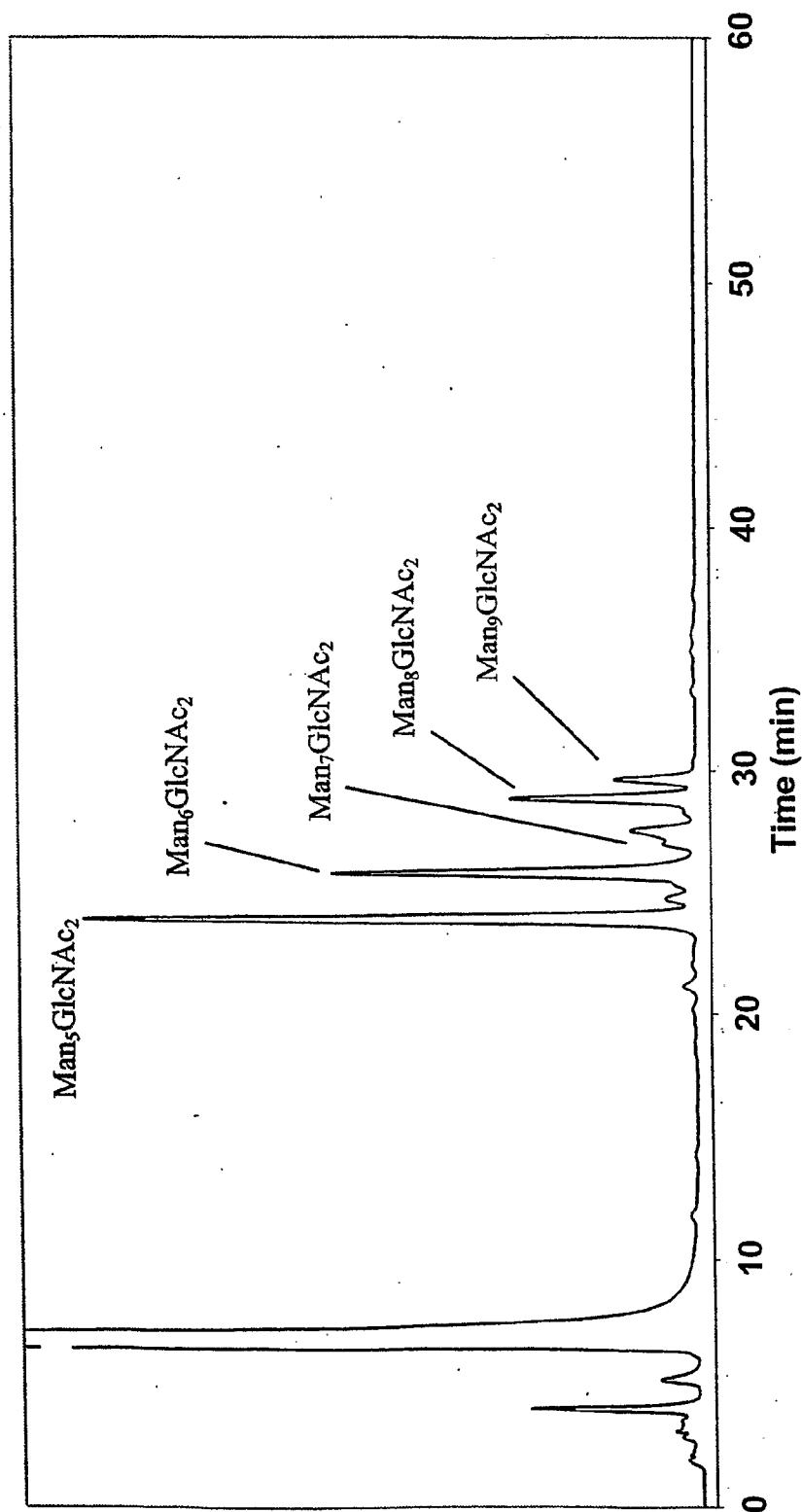


FIG. 180B

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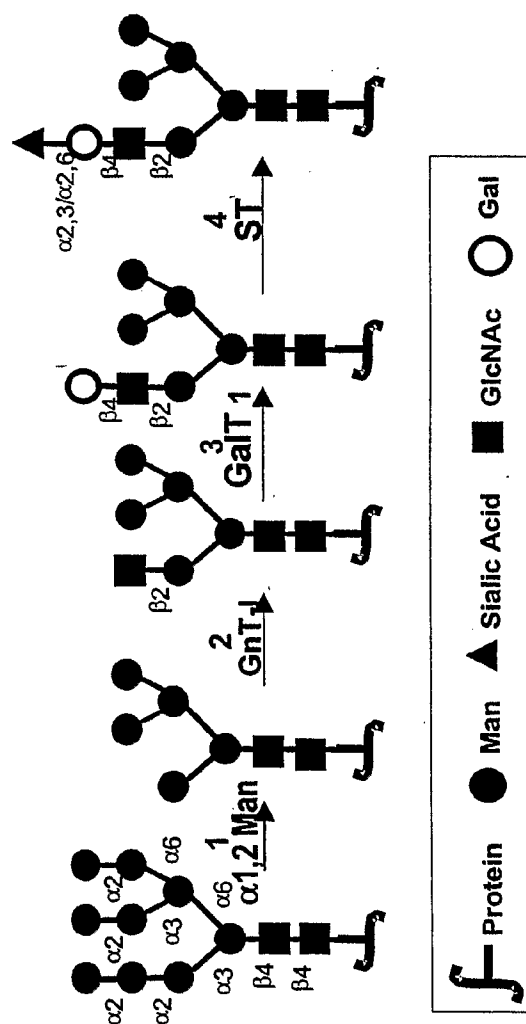


FIG. 181

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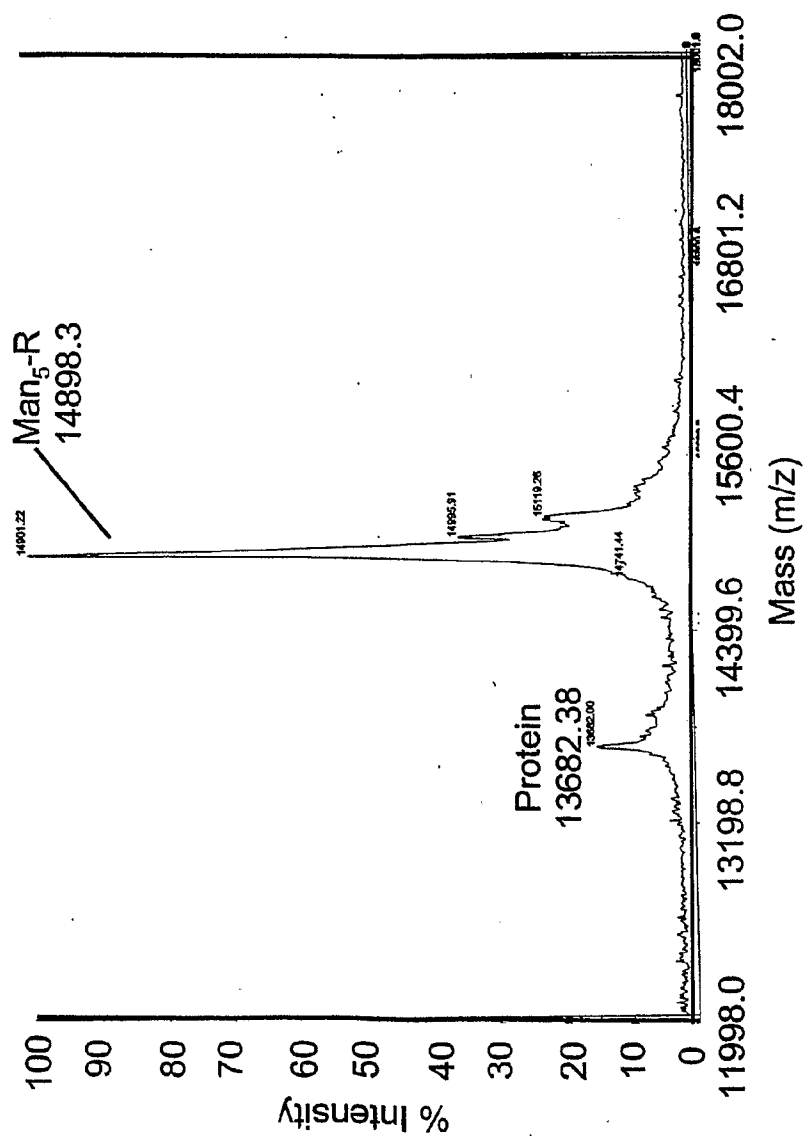


FIG. 182A

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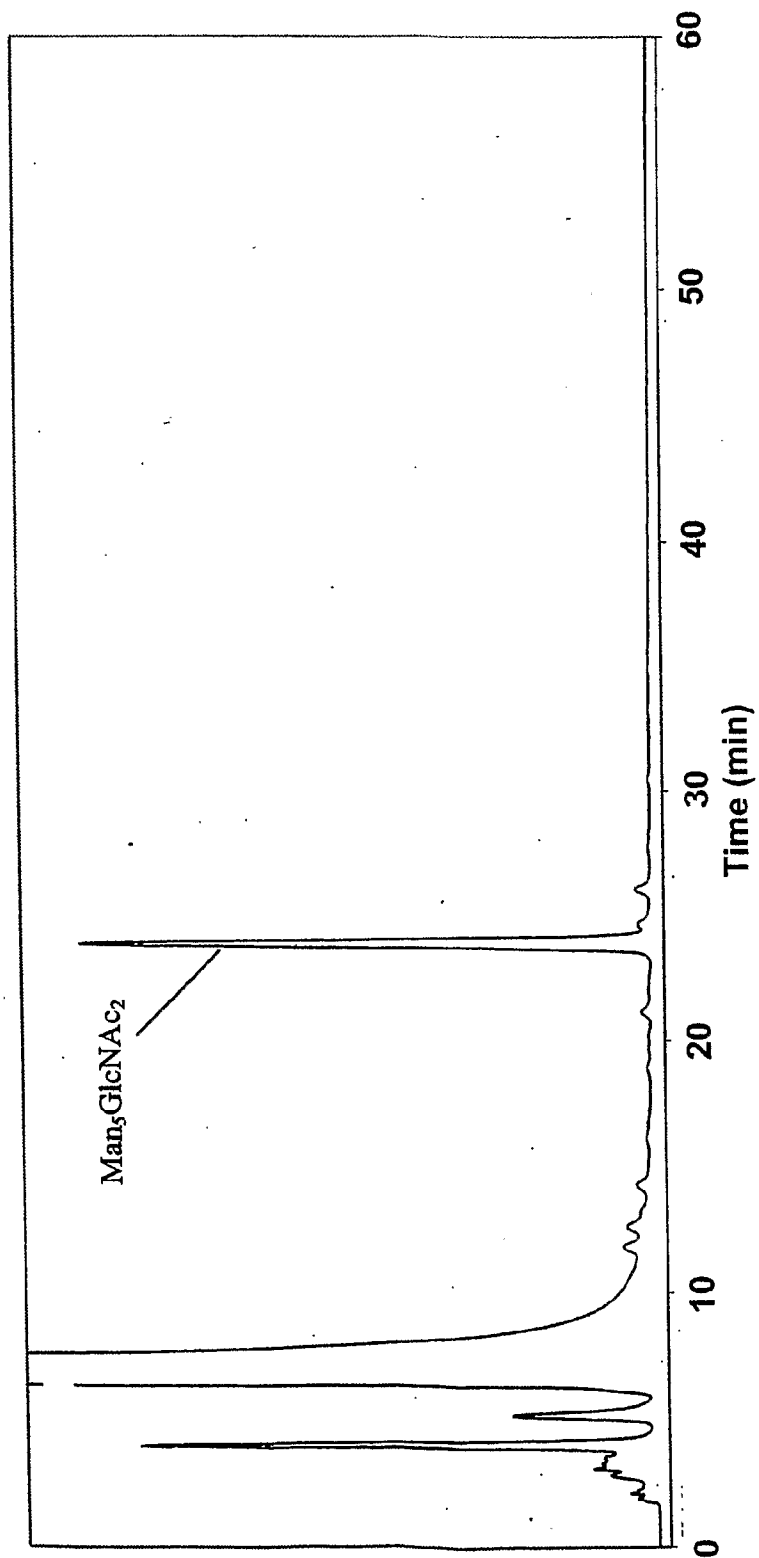


FIG. 182B

488/498

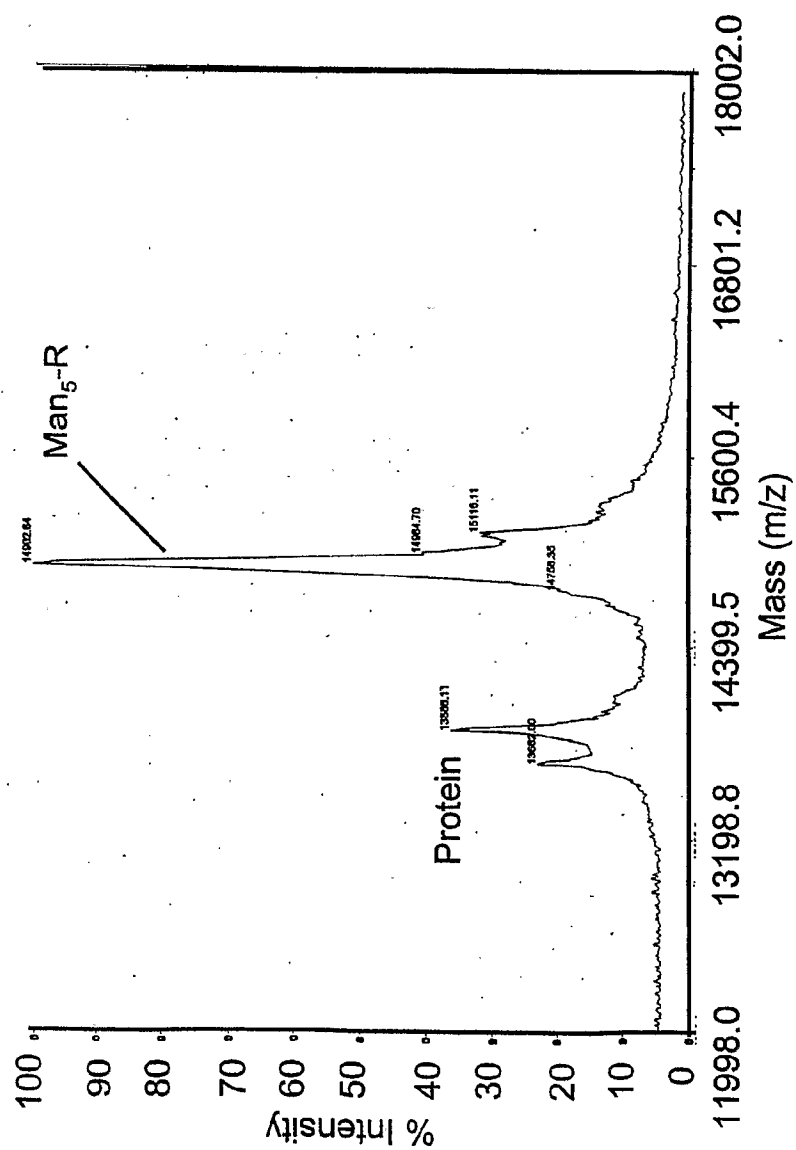


FIG. 183

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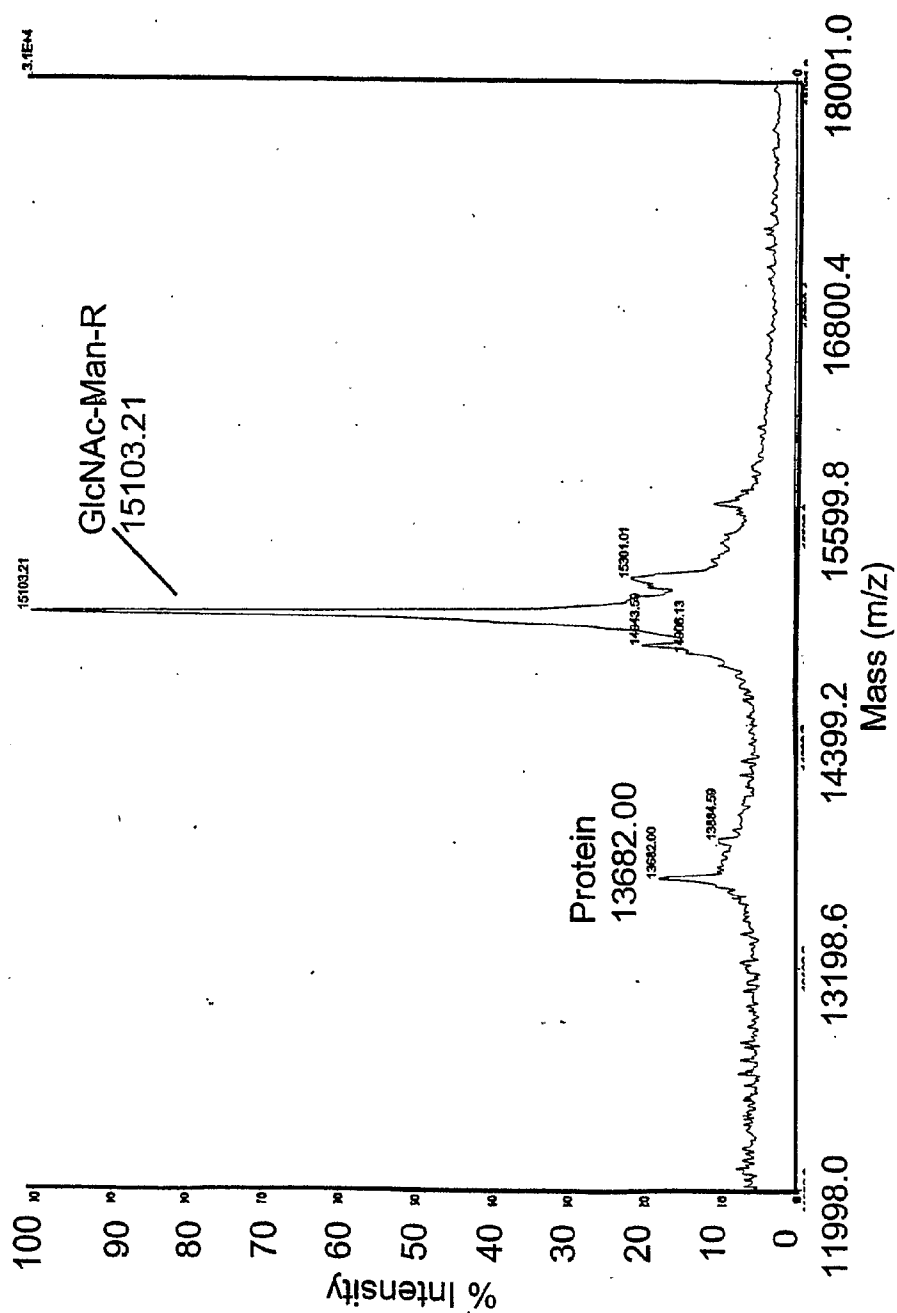


FIG. 184

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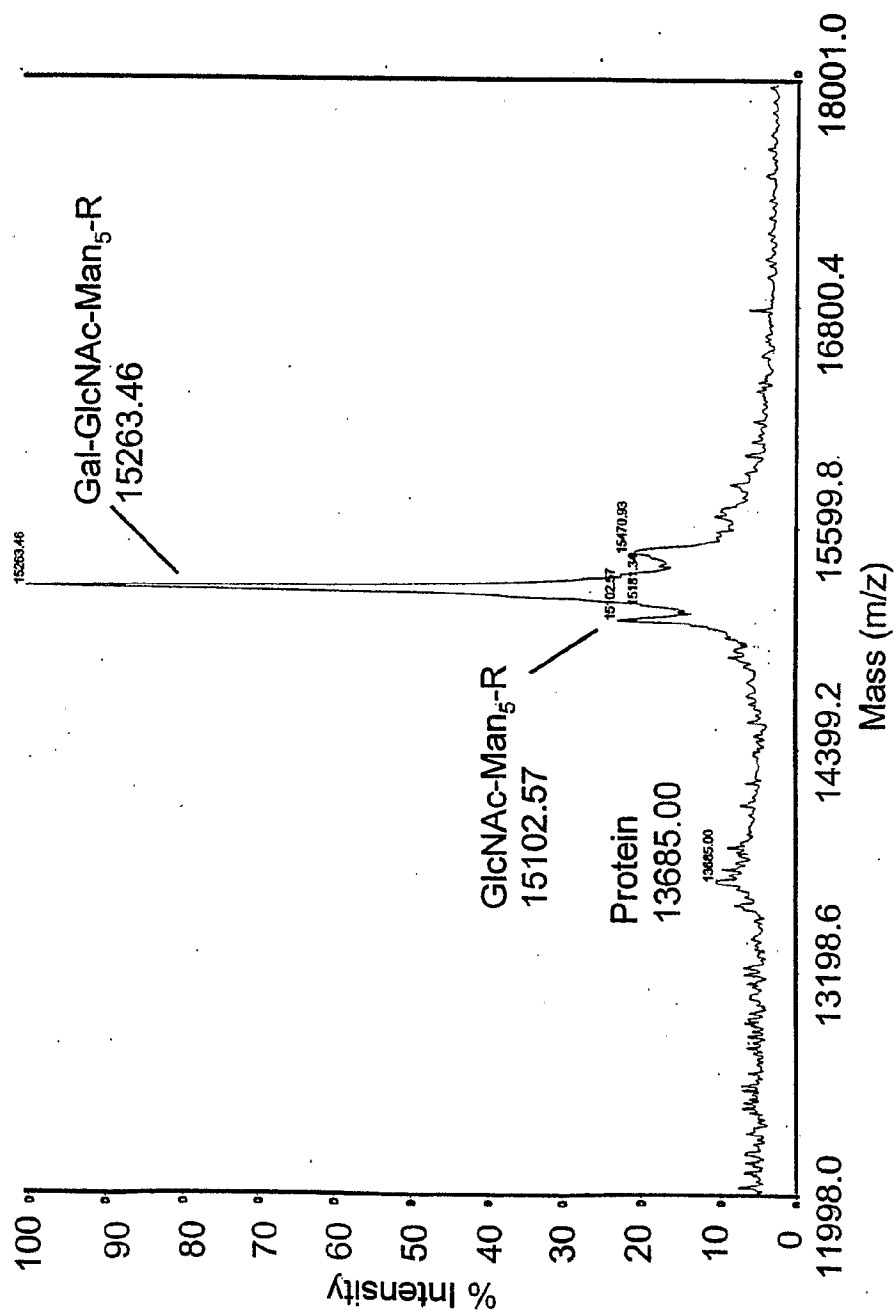


FIG. 185

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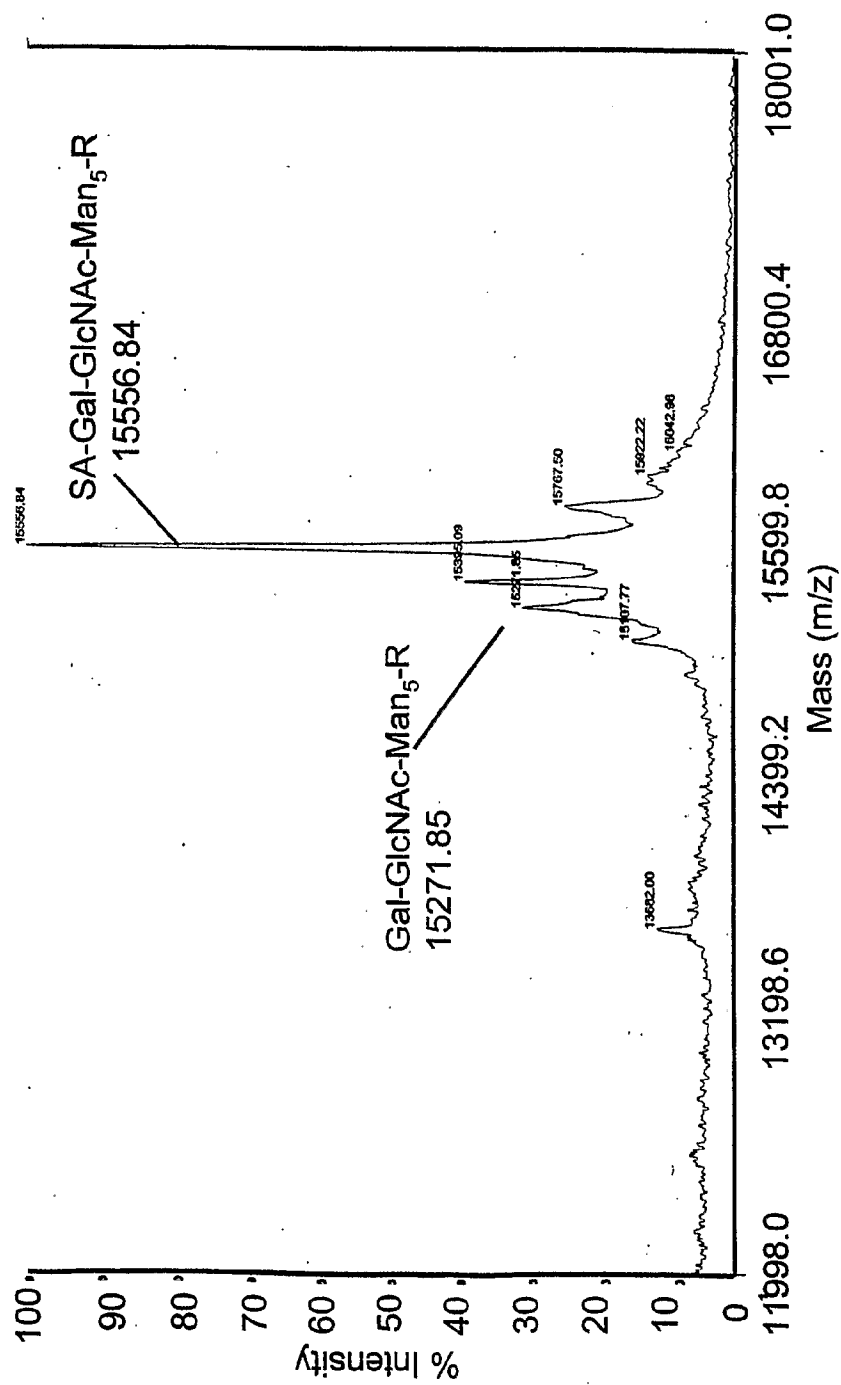


FIG. 186

[illegible]

FIG. 187A

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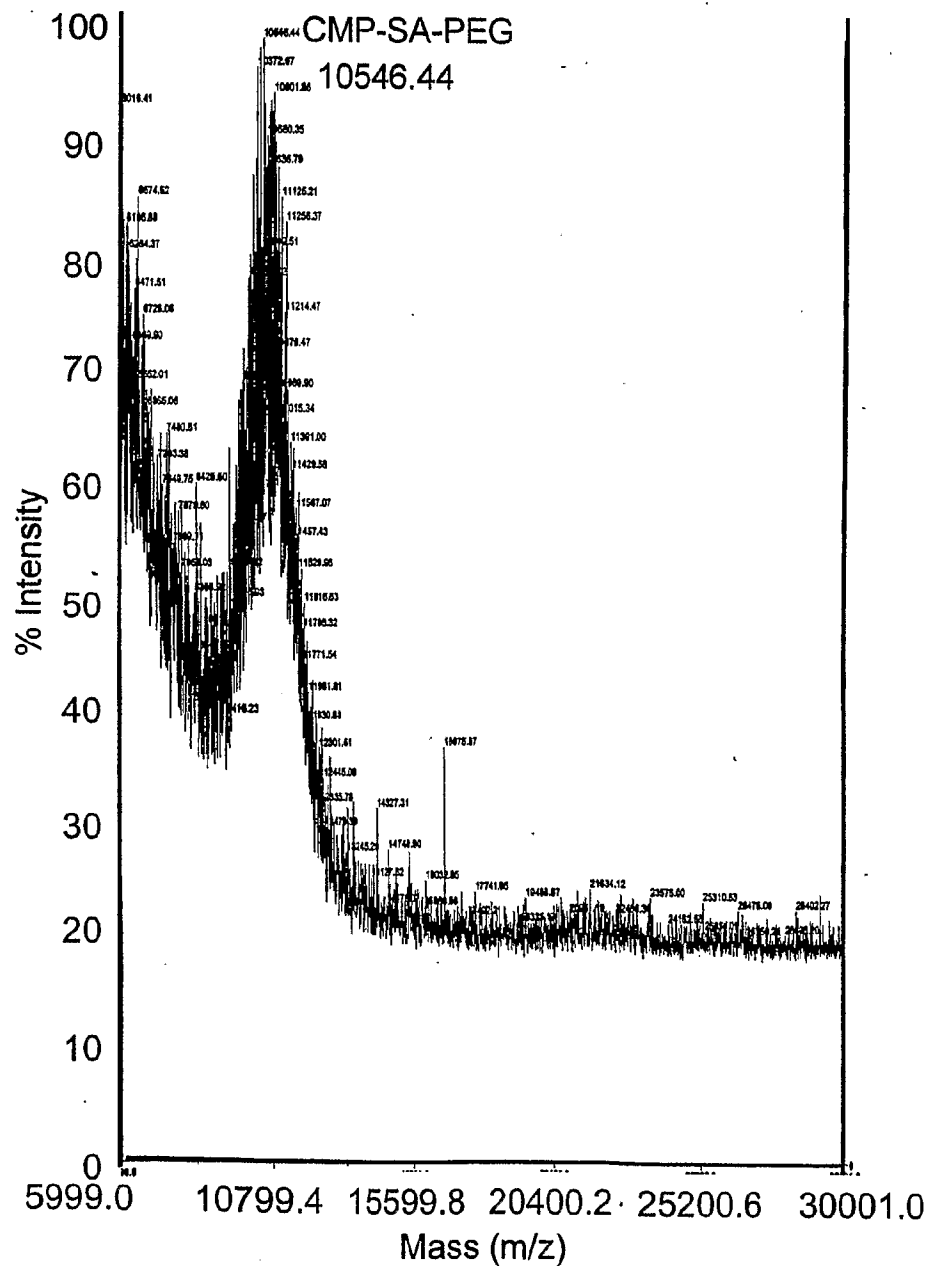


FIG. 187B

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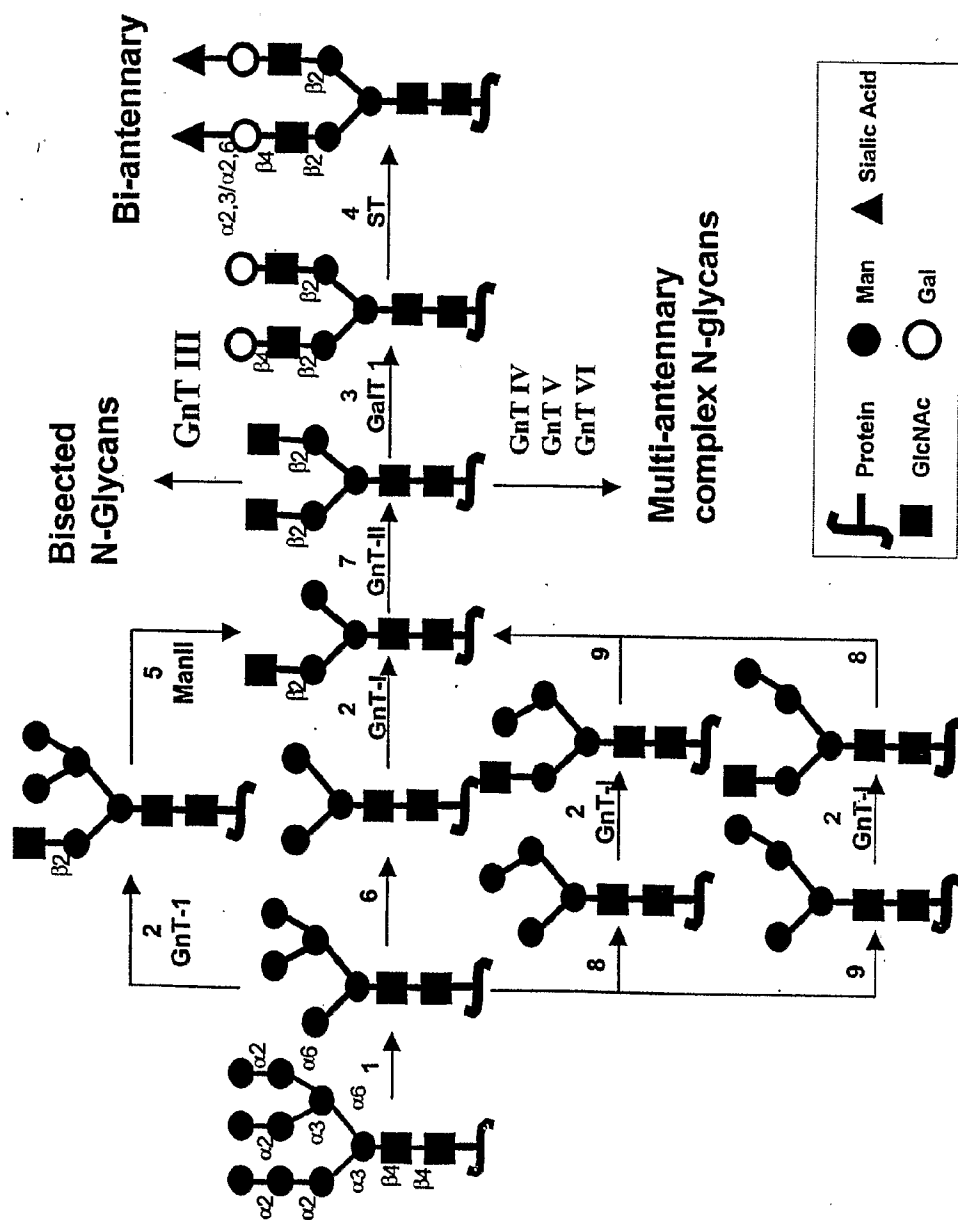


FIG. 188

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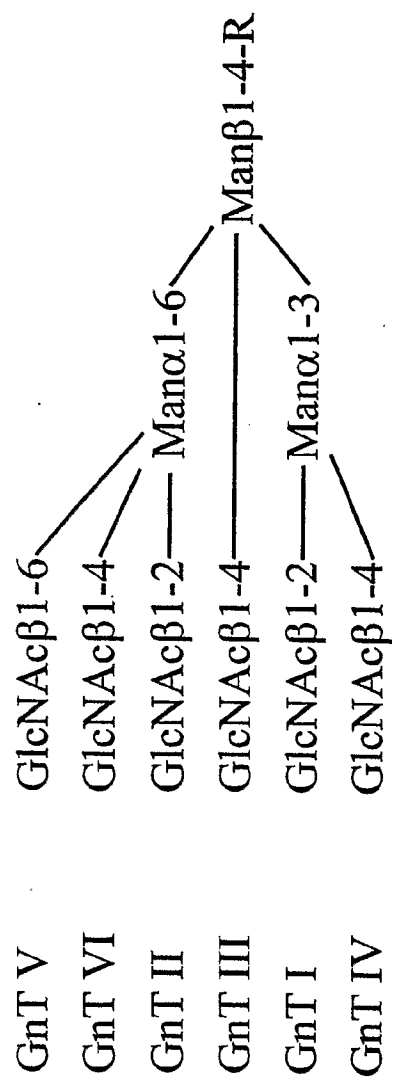


FIG. 189

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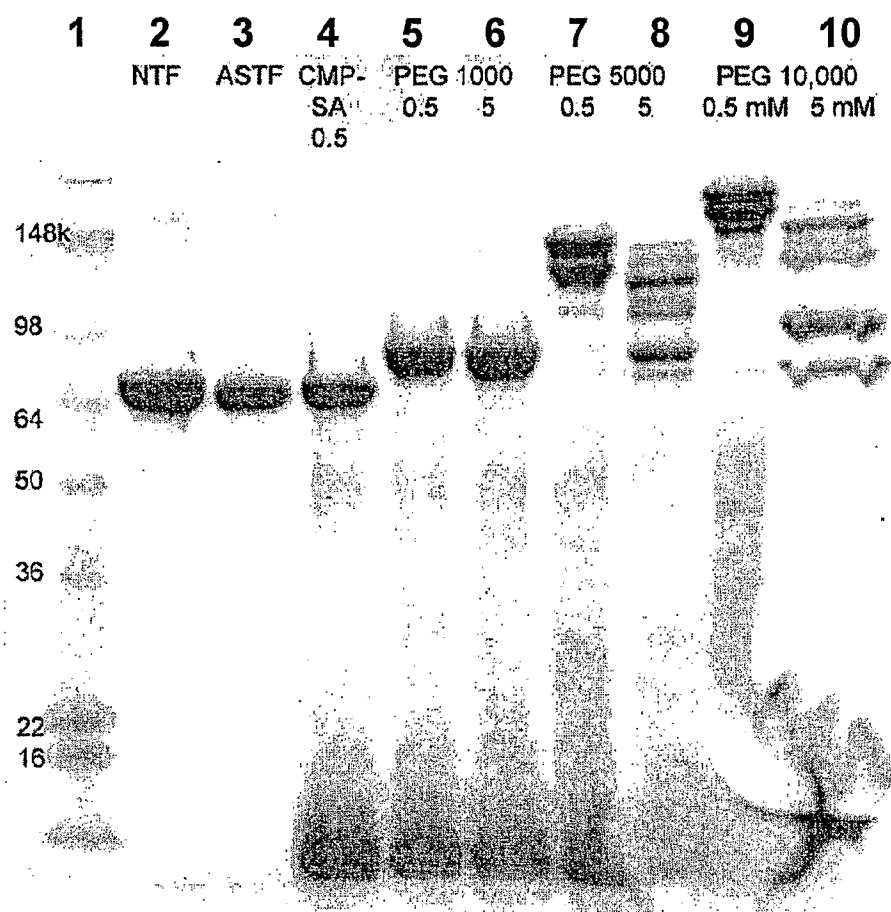


FIG. 190

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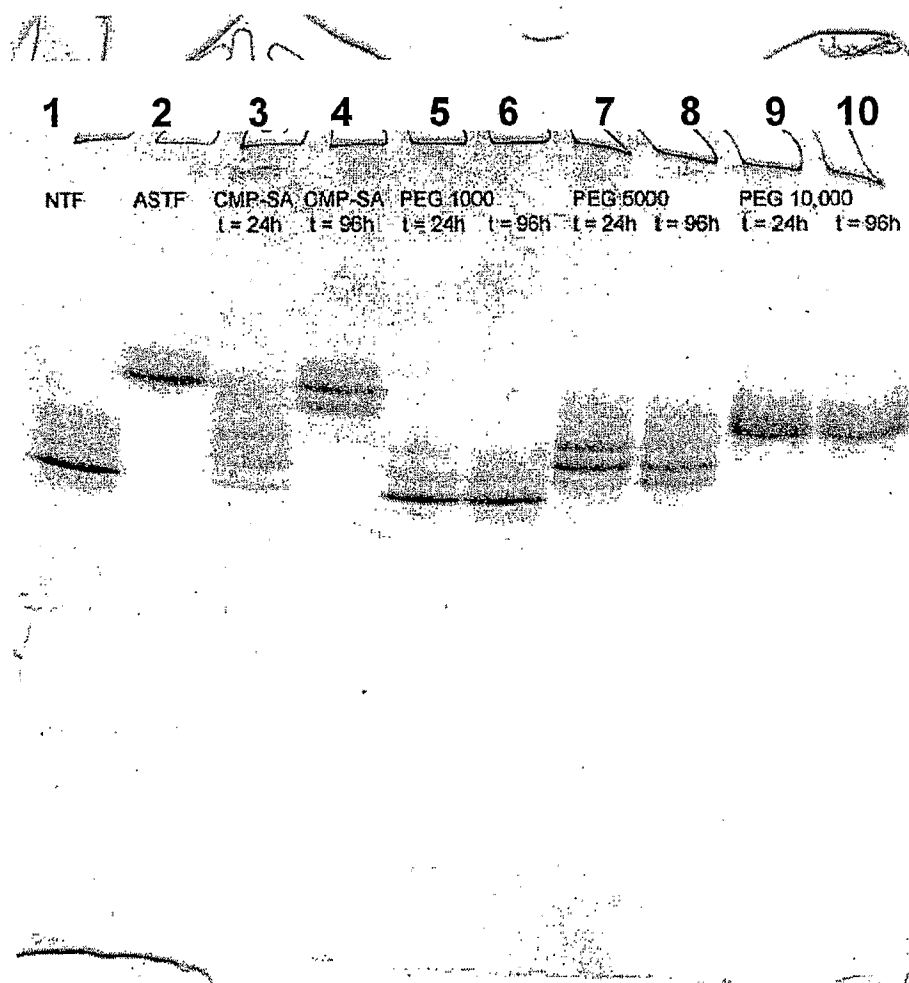
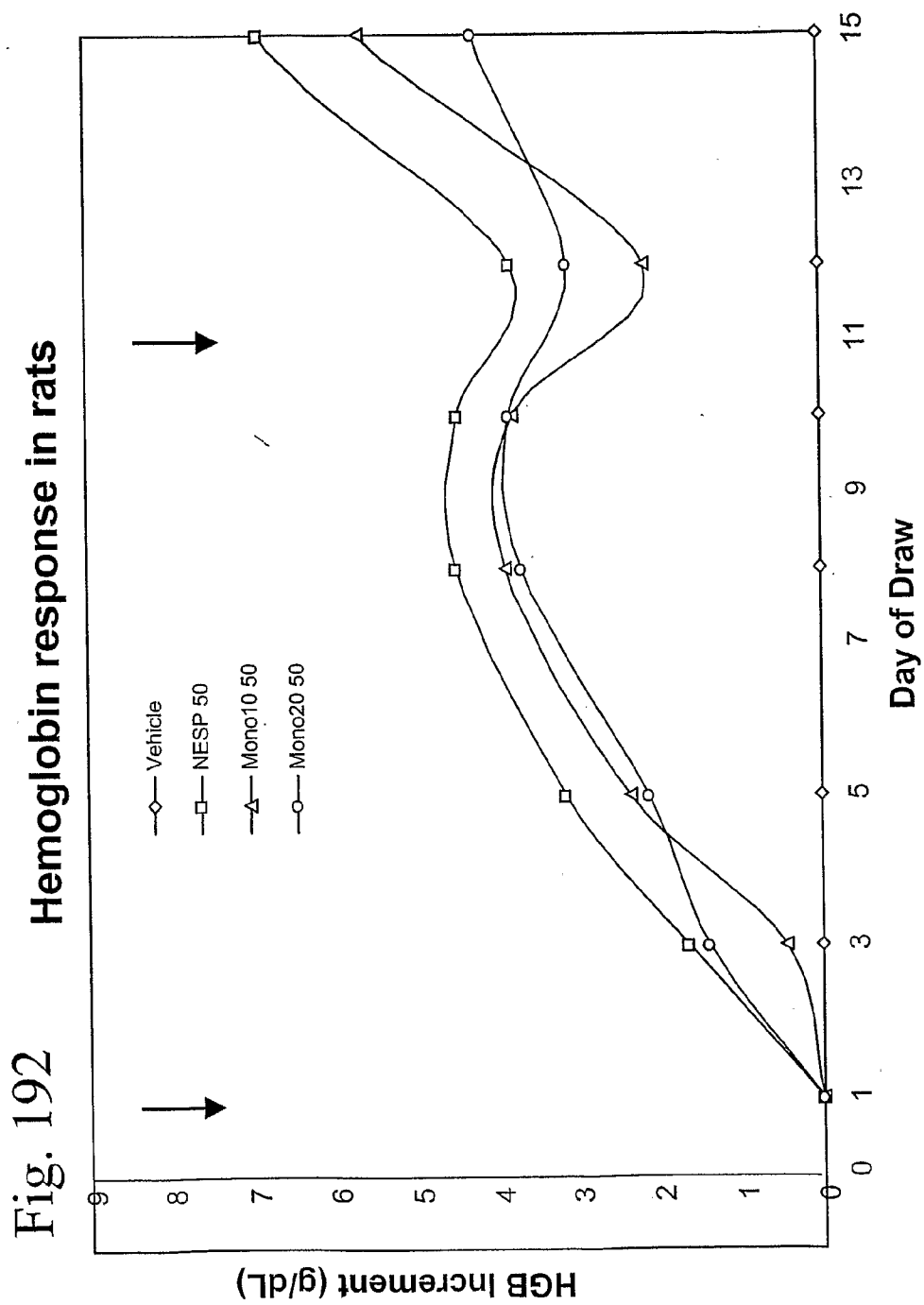


FIG. 191

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## SEQUENCE LISTING

<110> Neose Technologies, Inc.  
 DeFrees, Shawn  
 Zopf, David  
 Bayer, Robert  
 Hakes, David  
 Chen, Xi  
 Bowe, Caryne

<120> ERYTHROPOIETIN: REMODELING AND GLYCOCONJUGATION OF  
 ERYTHROPOIETIN

<130> 040853-01-5083WO

<150> PCT/US02/32263  
 <151> 2002-10-09

<150> US 10/287,994  
 <151> 2002-11-5

<150> US 10/360,770  
 <151> 2003-01-06

<150> US 10/369,779  
 <151> 2003-03-17

<150> US 10/410,945  
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 ctgtgccacc ccgaggagct ggtgctgctc ggacactctc tgggcatccc ctgggctccc 180  
 ctgagcagct gcccagcca ggccctgcag ctggcaggct gcttgagcca actccatagc 240  
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 cccaccttgg acacactgca gctggacgtc gccgactttg ccaccaccat ctggcagcag 360  
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 gcctctgctt tccagcgccg ggcaggaggg gtcctgggtg cctccatct gcagagcttc 480  
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 20 25 30  
 Glu Lys Leu Cys Ala Thr Tyr Lys Leu Cys His Pro Glu Glu Leu Val  
 35 40 45  
 Leu Leu Gly His Ser Leu Gly Ile Pro Trp Ala Pro Leu Ser Ser Cys  
 50 55 60  
 Pro Ser Gln Ala Leu Gln Leu Ala Gly Cys Leu Ser Gln Leu His Ser  
 65 70 75 80  
 Gly Leu Phe Leu Tyr Gln Gly Leu Leu Gln Ala Leu Glu Gly Ile Ser  
 85 90 95  
 Pro Glu Leu Gly Pro Thr Leu Asp Thr Leu Gln Leu Asp Val Ala Asp  
 100 105 110  
 Phe Ala Thr Thr Ile Trp Gln Gln Met Glu Glu Leu Gly Met Ala Pro  
 115 120 125  
 Ala Leu Gln Pro Thr Gln Gly Ala Met Pro Ala Phe Ala Ser Ala Phe  
 130 135 140  
 Gln Arg Arg Ala Gly Gly Val Leu Val Ala Ser His Leu Gln Ser Phe  
 145 150 155 160  
 Leu Glu Val Ser Tyr Arg Val Leu Arg His Leu Ala Gln Pro  
 165 170

&lt;210&gt; 3

&lt;211&gt; 1733

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 3

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 tgcaataata aaacattaac ttatactttt ttaatttaat gtatagaata gagatataca 180  
 taggatatgt aaatagatac acagtgtata tgtgattaaa atataatggg agattcaatc 240  
 agaaaaaagt ttctaataaag gctctggggg aaaagaggaa ggaaacaata atgaaaaaaa 300  
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 caaaaggctg aaaccatccc tgtcctccat gagatgatcc agcagatctt caatctcttc 780  
 agcacaaagg actcatctgc tgcttgggat gagaccctcc tagacaaatt ctacactgaa 840  
 ctctaccagc agctgaatga cctggaagcc tgtgtgatac aggggggtgg ggtgacagag 900  
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 taaaaataaa ctttctgtaa accaagttgt atgttgact caagataaca ggggtgaacct 1620  
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&lt;210&gt; 4

&lt;211&gt; 188

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 4

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 1 5 10 15

Lys Ser Ser Cys Ser Val Gly Cys Asp Leu Pro Gln Thr His Ser Leu  
 20 25 30

Gly Ser Arg Arg Thr Leu Met Leu Leu Ala Gln Met Arg Arg Ile Ser  
 35 40 45

Leu Phe Ser Cys Leu Lys Asp Arg His Asp Phe Gly Phe Pro Gln Glu  
 50 55 60

Glu Phe Gly Asn Gln Phe Gln Lys Ala Glu Thr Ile Pro Val Leu His  
 65 70 75 80

Glu Met Ile Gln Gln Ile Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser

	85		90		95
Ala Ala Trp Asp Glu Thr Leu Leu Asp Lys Phe Tyr Thr Glu Leu Tyr					
	100		105		110
Gln Gln Leu Asn Asp Leu Glu Ala Cys Val Ile Gln Gly Val Gly Val					
	115		120		125
Thr Glu Thr Pro Leu Met Lys Glu Asp Ser Ile Leu Ala Val Arg Lys					
	130		135		140
Tyr Phe Gln Arg Ile Thr Leu Tyr Leu Lys Glu Lys Lys Tyr Ser Pro					
	145		150		155
Cys Ala Trp Glu Val Val Arg Ala Glu Ile Met Arg Ser Phe Ser Leu					
	165		170		175
Ser Thr Asn Leu Gln Glu Ser Leu Arg Ser Lys Glu					
	180		185		

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 ctctgtggc aattgaatgg gaggttgaa tattgcctca aggacaggat gaactttgac 180  
 atccctgagg agattaagca gctgcagcag ttccagaagg aggacgccgc attgaccatc 240  
 tatgagatgc tccagaacat ctttgctatt ttccagacaag attcatctag cactggctgg 300  
 aatgagacta ttgttgagaa cctcctggct aatgtctatc atcagataaa ccatctgaag 360  
 acagtcctgg aagaaaaact ggagaaagaa gattttacca ggggaaaact catgagcagt 420  
 ctgcacctga aaagatatta tgggaggatt ctgcattacc tgaaggccaa ggagtacagt 480  
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 Ser Ser Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg  
 35 40 45  
 Leu Glu Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu  
 50 55 60  
 Ile Lys Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile  
 65 70 75 80  
 Tyr Glu Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser  
 85 90 95  
 Ser Thr Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val  
 100 105 110  
 Tyr His Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu  
 115 120 125  
 Lys Glu Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys  
 130 135 140  
 Arg Tyr Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser  
 145 150 155 160  
 His Cys Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr  
 165 170 175  
 Phe Ile Asn Arg Leu Thr Gly Tyr Leu Arg Asn  
 180 185

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 gcgttccttg aggagctgcg gccgggctcc ctggagaggg agtgcaagga ggagcagtgc 180  
 tccttcgagg aggccggga gatcttcaag gacgcggaga ggacgaagct gttctggatt 240  
 tcttacagtg atggggacca gtgtgcctca agtccatgcc agaattggggg ctccctgcaag 300  
 gaccagctcc agtcctatat ctgcttctgc ctccctgcct tcgagggccg gaactgtgag 360  
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 aaaagaaatg ccagcaaacc ccaaggccga attgtggggg gcaagggtgtg ccccaaaggg 600  
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cggcggtggtg cgaggtcat catccccagc acgtacgtcc cgggcaccac caaccacgac 840
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agctgggggcc agggctgcgc aaccgtgggc cactttgggg tgtacaccag ggtctccag 1260
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gccccatttc cc 1332

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 Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val  
 20 25 30  
 Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro  
 35 40 45  
 Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu  
 50 55 60  
 Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile  
 65 70 75 80  
 Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly  
 85 90 95  
 Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro  
 100 105 110  
 Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile  
 115 120 125  
 Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr  
 130 135 140  
 Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala  
 145 150 155 160  
 Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile  
 165 170 175

Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val  
 180 185 190  
 Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu  
 195 200 205  
 Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile  
 210 215 220  
 Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg  
 225 230 235 240  
 Asn Leu Ile Ala Val Leu Gly Glu His Asp Leu Ser Glu His Asp Gly  
 245 250 255  
 Asp Glu Gln Ser Arg Arg Val Ala Gln Val Ile Ile Pro Ser Thr Tyr  
 260 265 270  
 Val Pro Gly Thr Thr Asn His Asp Ile Ala Leu Leu Arg Leu His Gln  
 275 280 285  
 Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg  
 290 295 300  
 Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser  
 305 310 315 320  
 Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met  
 325 330 335  
 Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser  
 340 345 350  
 Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala  
 355 360 365  
 Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly  
 370 375 380  
 Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val  
 385 390 395 400  
 Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr  
 405 410 415  
 Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu  
 420 425 430  
 Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro  
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<210> 9  
 <211> 1437  
 <212> DNA  
 <213> Homo sapiens

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ctgaatcggc caaagaggta taattcaggt aaattggaag agtttgttca aggggaacctt 180  
 gagagagaat gtatggaaga aaagtgtagt tttgaagaac cacgagaagt ttttgaaaac 240  
 actgaaaaga caactgaatt ttggaagcag tatgttgatg gagatcagtg tgagtccaat 300  
 ccatgtttta atggcggcag ttgcaaggat gacattaatt cctatgaatg ttgggtgtccc 360  
 tttggatttg aaggaaaaga ctgtgaatta gatgtaacat gtaacattaa gaatggcaga 420  
 tgcgagcagt tttgtaaaaa tagtgctgat aacaagggtg tttgctcctg tactgagggg 480  
 tatcgacttg cagaaaacca gaagtcctgt gaaccagcag tgccatttcc atgtggaaga 540  
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 tttaatgact tcactcgggt tgttggtgga gaagatgcca aaccagggtca attcccttgg 720  
 cagggtgttt tgaatggtaa agttgatgca ttctgtggag gctctatcgt taatgaaaaa 780  
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 aaatatggaa tatataccaa ggtatcccg tatgtcaact ggattaagga aaaaacaaag 1380  
 ctacttaat gaaagatgga tttccaagg taattcattg gaattgaaaa ttaacag 1437

&lt;210&gt; 10

&lt;211&gt; 462

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 10

Met Gln Arg Val Asn Met Ile Met Ala Glu Ser Pro Ser Leu Ile Thr  
 1 5 10 15

Ile Cys Leu Leu Gly Tyr Leu Leu Ser Ala Glu Cys Thr Val Phe Leu  
 20 25 30

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn  
 35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys

50	55	60
Met Glu Glu Lys Cys Ser Phe Glu Glu Pro Arg Glu Val Phe Glu Asn 65 70 75 80		
Thr Glu Lys Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln 85 90 95		
Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile 100 105 110		
Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys 115 120 125		
Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe 130 135 140		
Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly 145 150 155 160		
Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe 165 170 175		
Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala 180 185 190		
Glu Ala Val Phe Pro Asp Val Asp Tyr Val Asn Pro Thr Glu Ala Glu 195 200 205		
Thr Ile Leu Asp Asn Ile Thr Gln Gly Thr Gln Ser Phe Asn Asp Phe 210 215 220		
Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp 225 230 235 240		
Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile 245 250 255		
Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly 260 265 270		
Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu 275 280 285		
His Thr Glu Gln Lys Arg Asn Val Ile Arg Ala Ile Ile Pro His His 290 295 300		
Asn Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu 305 310 315 320		
Glu Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys 325 330 335		
Ile Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly 340 345 350		
Tyr Val Ser Gly Trp Ala Arg Val Phe His Lys Gly Arg Ser Ala Leu 355 360 365		
Val Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu 370 375 380		

Arg Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe  
 385 390 395 400

His Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His  
 405 410 415

Val Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp  
 420 425 430

Gly Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val  
 435 440 445

Ser Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr  
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<210> 11  
 <211> 603  
 <212> DNA  
 <213> Homo sapiens

<400> 11  
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 ttctttctccc agcgggtgc cccaatactt cagtgcattg gctgctgctt ctctagagca 180  
 tatcccactc cactaaggtc caagaagacg atgttggtcc aaaagaacgt cacctcagag 240  
 tccacttgct gtgtagctaa atcatataac agggtcacag taatggggggg tttcaaagtg 300  
 gagaaccaca cggcgtgcc aatgcagtact tgttattatc acaaatttta aatgttttac 360  
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 atc 603

<210> 12  
 <211> 116  
 <212> PRT  
 <213> Homo sapiens

<400> 12  
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Val Phe Leu His Val Leu His Ser Ala Pro Asp Val Gln Asp Cys Pro  
 20 25 30

Glu Cys Thr Leu Gln Glu Asn Pro Phe Phe Ser Gln Pro Gly Ala Pro  
 35 40 45

Ile Leu Gln Cys Met Gly Cys Cys Phe Ser Arg Ala Tyr Pro Thr Pro  
 50 55 60

Leu Arg Ser Lys Lys Thr Met Leu Val Gln Lys Asn Val Thr Ser Glu  
65 70 75 80

Ser Thr Cys Cys Val Ala Lys Ser Tyr Asn Arg Val Thr Val Met Gly  
85 90 95

Gly Phe Lys Val Glu Asn His Thr Ala Cys His Cys Ser Thr Cys Tyr  
100 105 110

Tyr His Lys Ser  
115

<210> 13  
<211> 390  
<212> DNA  
<213> Homo sapiens

<400> 13  
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atcaacacca cttggtgtgc tggctactgc tacaccaggg atctggtgta taaggaccca 180  
gccaggccca aaatccagaa aacatgtacc ttcaaggaac tggatatatga aacagtgaga 240  
gtgcccggct gtgctcacca tgcagattcc ttgtatacat acccagtggc caccagtgt 300  
cactgtggca agtgtgacag cgacagcact gattgtactg tgcgaggcct ggggccagc 360  
tactgctcct ttggtgaaat gaaagaataa 390

<210> 14  
<211> 129  
<212> PRT  
<213> Homo sapiens

<400> 14  
Met Lys Thr Leu Gln Phe Phe Phe Leu Phe Cys Cys Trp Lys Ala Ile  
1 5 10 15  
Cys Cys Asn Ser Cys Glu Leu Thr Asn Ile Thr Ile Ala Ile Glu Lys  
20 25 30  
Glu Glu Cys Arg Phe Cys Ile Ser Ile Asn Thr Thr Trp Cys Ala Gly  
35 40 45  
Tyr Cys Tyr Thr Arg Asp Leu Val Tyr Lys Asp Pro Ala Arg Pro Lys  
50 55 60  
Ile Gln Lys Thr Cys Thr Phe Lys Glu Leu Val Tyr Glu Thr Val Arg  
65 70 75 80  
Val Pro Gly Cys Ala His His Ala Asp Ser Leu Tyr Thr Tyr Pro Val  
85 90 95  
Ala Thr Gln Cys His Cys Gly Lys Cys Asp Ser Asp Ser Thr Asp Cys  
100 105 110  
Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe Gly Glu Met Lys

115

120

125

Glu

&lt;210&gt; 15

&lt;211&gt; 1342

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 15

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gatgggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc 240
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aaaccaccaa aaaaaaaaaa aa 1342

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&lt;210&gt; 16

&lt;211&gt; 193

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 16

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu  
 1 5 10 15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu  
 20 25 30

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu  
 35 40 45

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu  
 50 55 60

Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg  
 65 70 75 80

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu  
 85 90 95

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser  
 100 105 110

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly  
 115 120 125

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Arg Ala Gln Lys Glu  
 130 135 140

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile  
 145 150 155 160

Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu  
 165 170 175

Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp  
 180 185 190

Arg

&lt;210&gt; 17

&lt;211&gt; 435

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 17

atgtggctgc agagcctgct gctcttgggc actgtggcct gcagcatctc tgcacccgcc 60  
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ccagtcagg agtga

435

<210> 18  
 <211> 144  
 <212> PRT  
 <213> Homo sapiens

<400> 18  
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 20 25 30  
 Val Asn Ala Ile Gln Glu Ala Arg Arg Leu Leu Asn Leu Ser Arg Asp  
 35 40 45  
 Thr Ala Ala Glu Met Asn Glu Thr Val Glu Val Ile Ser Glu Met Phe  
 50 55 60  
 Asp Leu Gln Glu Pro Thr Cys Leu Gln Thr Arg Leu Glu Leu Tyr Lys  
 65 70 75 80  
 Gln Gly Leu Arg Gly Ser Leu Thr Lys Leu Lys Gly Pro Leu Thr Met  
 85 90 95  
 Met Ala Ser His Tyr Lys Gln His Cys Pro Pro Thr Pro Glu Thr Ser  
 100 105 110  
 Cys Ala Thr Gln Ile Ile Thr Phe Glu Ser Phe Lys Glu Asn Leu Lys  
 115 120 125  
 Asp Phe Leu Leu Val Ile Pro Phe Asp Cys Trp Glu Pro Val Gln Glu  
 130 135 140

<210> 19  
 <211> 501  
 <212> DNA  
 <213> Homo sapiens

<400> 19  
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 aatgtcaagt ttttcaatag caacaaaaag aaacgagatg acttcgaaaa gctgactaat 360  
 tattcggtaa ctgacttgaa tgtccaacgc aaagcaatac atgaactcat ccaagtgatg 420  
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<210> 20  
 <211> 166

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 20

Met Lys Tyr Thr Ser Tyr Ile Leu Ala Phe Gln Leu Cys Ile Val Leu  
 1 5 10 15

Gly Ser Leu Gly Cys Tyr Cys Gln Asp Pro Tyr Val Lys Glu Ala Glu  
 20 25 30

Asn Leu Lys Lys Tyr Phe Asn Ala Gly His Ser Asp Val Ala Asp Asn  
 35 40 45

Gly Thr Leu Phe Leu Gly Ile Leu Lys Asn Trp Lys Glu Glu Ser Asp  
 50 55 60

Arg Lys Ile Met Gln Ser Gln Ile Val Ser Phe Tyr Phe Lys Leu Phe  
 65 70 75 80

Lys Asn Phe Lys Asp Asp Gln Ser Ile Gln Lys Ser Val Glu Thr Ile  
 85 90 95

Lys Glu Asp Met Asn Val Lys Phe Phe Asn Ser Asn Lys Lys Lys Arg  
 100 105 110

Asp Asp Phe Glu Lys Leu Thr Asn Tyr Ser Val Thr Asp Leu Asn Val  
 115 120 125

Gln Arg Lys Ala Ile His Glu Leu Ile Gln Val Met Ala Glu Leu Ser  
 130 135 140

Pro Ala Ala Lys Thr Gly Lys Arg Lys Arg Ser Gln Met Leu Phe Arg  
 145 150 155 160

Gly Arg Arg Ala Ser Gln  
 165

&lt;210&gt; 21

&lt;211&gt; 1352

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 21

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<210> 22  
 <211> 418  
 <212> PRT  
 <213> Homo sapiens

<400> 22  
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 Gln Lys Thr Asp Thr Ser His His Asp Gln Asp His Pro Thr Phe Asn  
 35 40 45  
 Lys Ile Thr Pro Asn Leu Ala Glu Phe Ala Phe Ser Leu Tyr Arg Gln  
 50 55 60  
 Leu Ala His Gln Ser Asn Ser Thr Asn Ile Phe Phe Ser Pro Val Ser  
 65 70 75 80  
 Ile Ala Thr Ala Phe Ala Met Leu Ser Leu Gly Thr Lys Ala Asp Thr  
 85 90 95  
 His Asp Glu Ile Leu Glu Gly Leu Asn Phe Asn Leu Thr Glu Ile Pro  
 100 105 110  
 Glu Ala Gln Ile His Glu Gly Phe Gln Glu Leu Leu Arg Thr Leu Asn  
 115 120 125  
 Gln Pro Asp Ser Gln Leu Gln Leu Thr Thr Gly Asn Gly Leu Phe Leu  
 130 135 140

Ser Glu Gly Leu Lys Leu Val Asp Lys Phe Leu Glu Asp Val Lys Lys  
 145 150 155 160  
 Leu Tyr His Ser Glu Ala Phe Thr Val Asn Phe Gly Asp Thr Glu Glu  
 165 170 175  
 Ala Lys Lys Gln Ile Asn Asp Tyr Val Glu Lys Gly Thr Gln Gly Lys  
 180 185 190  
 Ile Val Asp Leu Val Lys Glu Leu Asp Arg Asp Thr Val Phe Ala Leu  
 195 200 205  
 Val Asn Tyr Ile Phe Phe Lys Gly Lys Trp Glu Arg Pro Phe Glu Val  
 210 215 220  
 Lys Asp Thr Glu Glu Glu Asp Phe His Val Asp Gln Val Thr Thr Val  
 225 230 235 240  
 Lys Val Pro Met Met Lys Arg Leu Gly Met Phe Asn Ile Gln His Cys  
 245 250 255  
 Lys Lys Leu Ser Ser Trp Val Leu Leu Met Lys Tyr Leu Gly Asn Ala  
 260 265 270  
 Thr Ala Ile Phe Phe Leu Pro Asp Glu Gly Lys Leu Gln His Leu Glu  
 275 280 285  
 Asn Glu Leu Thr His Asp Ile Ile Thr Lys Phe Leu Glu Asn Glu Asp  
 290 295 300  
 Arg Arg Ser Ala Ser Leu His Leu Pro Lys Leu Ser Ile Thr Gly Thr  
 305 310 315 320  
 Tyr Asp Leu Lys Ser Val Leu Gly Gln Leu Gly Ile Thr Lys Val Phe  
 325 330 335  
 Ser Asn Gly Ala Asp Leu Ser Gly Val Thr Glu Glu Ala Pro Leu Lys  
 340 345 350  
 Leu Ser Lys Ala Val His Lys Ala Val Leu Thr Ile Asp Glu Lys Gly  
 355 360 365  
 Thr Glu Ala Ala Gly Ala Met Phe Leu Glu Ala Ile Pro Met Ser Ile  
 370 375 380  
 Pro Pro Glu Val Lys Phe Asn Lys Pro Phe Val Phe Leu Met Ile Glu  
 385 390 395 400  
 Gln Asn Thr Lys Ser Pro Leu Phe Met Gly Lys Val Val Asn Pro Thr  
 405 410 415

Gln Lys

<210> 23  
 <211> 2004  
 <212> DNA  
 <213> Homo sapiens

<400> 23  
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tcatggctgg	cagcctcaca	ggtttgcttc	tacttcaggc	agtgtcgtgg	gcatcaggtg	240
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 <212> PRT  
 <213> Homo sapiens

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 Trp Asp Tyr Met Gln Ser Asp Leu Gly Glu Leu Pro Val Asp Ala Arg  
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 Phe Pro Pro Arg Val Pro Lys Ser Phe Pro Phe Asn Thr Ser Val Val  
 50 55 60  
 Tyr Lys Lys Thr Leu Phe Val Glu Phe Thr Asp His Leu Phe Asn Ile  
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 Ala Lys Pro Arg Pro Pro Trp Met Gly Leu Leu Gly Pro Thr Ile Gln  
 85 90 95  
 Ala Glu Val Tyr Asp Thr Val Val Ile Thr Leu Lys Asn Met Ala Ser  
 100 105 110  
 His Pro Val Ser Leu His Ala Val Gly Val Ser Tyr Trp Lys Ala Ser  
 115 120 125  
 Glu Gly Ala Glu Tyr Asp Asp Gln Thr Ser Gln Arg Glu Lys Glu Asp  
 130 135 140  
 Asp Lys Val Phe Pro Gly Gly Ser His Thr Tyr Val Trp Gln Val Leu  
 145 150 155 160  
 Lys Glu Asn Gly Pro Met Ala Ser Asp Pro Leu Cys Leu Thr Tyr Ser  
 165 170 175

Tyr Leu Ser His Val Asp Leu Val Lys Asp Leu Asn Ser Gly Leu Ile  
 180 185 190  
 Gly Ala Leu Leu Val Cys Arg Glu Gly Ser Leu Ala Lys Glu Lys Thr  
 195 200 205  
 Gln Thr Leu His Lys Phe Ile Leu Leu Phe Ala Val Phe Asp Glu Gly  
 210 215 220  
 Lys Ser Trp His Ser Glu Thr Lys Asn Ser Leu Met Gln Asp Arg Asp  
 225 230 235 240  
 Ala Ala Ser Ala Arg Ala Trp Pro Lys Met His Thr Val Asn Gly Tyr  
 245 250 255  
 Val Asn Arg Ser Leu Pro Gly Leu Ile Gly Cys His Arg Lys Ser Val  
 260 265 270  
 Tyr Trp His Val Ile Gly Met Gly Thr Thr Pro Glu Val His Ser Ile  
 275 280 285  
 Phe Leu Glu Gly His Thr Phe Leu Val Arg Asn His Arg Gln Ala Ser  
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 Leu Glu Ile Ser Pro Ile Thr Phe Leu Thr Ala Gln Thr Leu Leu Met  
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 Asp Leu Gly Gln Phe Leu Leu Phe Cys His Ile Ser Ser His Gln His  
 325 330 335  
 Asp Gly Met Glu Ala Tyr Val Lys Val Asp Ser Cys Pro Glu Glu Pro  
 340 345 350  
 Gln Leu Arg Met Lys Asn Asn Glu Glu Ala Glu Asp Tyr Asp Asp Asp  
 355 360 365  
 Leu Thr Asp Ser Glu Met Asp Val Val Arg Phe Asp Asp Asp Asn Ser  
 370 375 380  
 Pro Ser Phe Ile Gln Ile Arg Ser Val Ala Lys Lys His Pro Lys Thr  
 385 390 395 400  
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 405 410 415  
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 420 425 430  
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 Ala Tyr Thr Asp Glu Thr Phe Lys Thr Arg Glu Ala Ile Gln His Glu  
 450 455 460  
 Ser Gly Ile Leu Gly Pro Leu Leu Tyr Gly Glu Val Gly Asp Thr Leu  
 465 470 475 480  
 Leu Ile Ile Phe Lys Asn Gln Ala Ser Arg Pro Tyr Asn Ile Tyr Pro  
 485 490 495  
 His Gly Ile Thr Asp Val Arg Pro Leu Tyr Ser Arg Arg Leu Pro Lys

31

Glu Thr Phe Ser Asp Asp Pro Ser Pro Gly Ala Ile Asp Ser Asn Asn  
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 Ser Leu Ser Glu Met Thr His Phe Arg Pro Gln Leu His His Ser Gly  
 850 855 860  
 Asp Met Val Phe Thr Pro Glu Ser Gly Leu Gln Leu Arg Leu Asn Glu  
 865 870 875 880  
 Lys Leu Gly Thr Thr Ala Ala Thr Glu Leu Lys Lys Leu Asp Phe Lys  
 885 890 895  
 Val Ser Ser Thr Ser Asn Asn Leu Ile Ser Thr Ile Pro Ser Asp Asn  
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 Leu Ala Ala Gly Thr Asp Asn Thr Ser Ser Leu Gly Pro Pro Ser Met  
 915 920 925  
 Pro Val His Tyr Asp Ser Gln Leu Asp Thr Thr Leu Phe Gly Lys Lys  
 930 935 940  
 Ser Ser Pro Leu Thr Glu Ser Gly Gly Pro Leu Ser Leu Ser Glu Glu  
 945 950 955 960  
 Asn Asn Asp Ser Lys Leu Leu Glu Ser Gly Leu Met Asn Ser Gln Glu  
 965 970 975  
 Ser Ser Trp Gly Lys Asn Val Ser Ser Thr Glu Ser Gly Arg Leu Phe  
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 Met Leu Met Asp Lys Asn Ala Thr Ala Leu Arg Leu Asn His Met  
 1070 1075 1080  
 Ser Asn Lys Thr Thr Ser Ser Lys Asn Met Glu Met Val Gln Gln  
 1085 1090 1095  
 Lys Lys Glu Gly Pro Ile Pro Pro Asp Ala Gln Asn Pro Asp Met  
 1100 1105 1110  
 Ser Phe Phe Lys Met Leu Phe Leu Pro Glu Ser Ala Arg Trp Ile  
 1115 1120 1125  
 Gln Arg Thr His Gly Lys Asn Ser Leu Asn Ser Gly Gln Gly Pro  
 1130 1135 1140

33

1445	1450	1455
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1460	1465	1470
Asp Gln Arg Glu Val Gly	Ser Leu Gly Thr Ser	Ala Thr Asn Ser
1475	1480	1485
Val Thr Tyr Lys Lys Val	Glu Asn Thr Val Leu	Pro Lys Pro Asp
1490	1495	1500
Leu Pro Lys Thr Ser Gly	Lys Val Glu Leu Leu	Pro Lys Val His
1505	1510	1515
Ile Tyr Gln Lys Asp Leu	Phe Pro Thr Glu Thr	Ser Asn Gly Ser
1520	1525	1530
Pro Gly His Leu Asp Leu	Val Glu Gly Ser Leu	Leu Gln Gly Thr
1535	1540	1545
Glu Gly Ala Ile Lys Trp	Asn Glu Ala Asn Arg	Pro Gly Lys Val
1550	1555	1560
Pro Phe Leu Arg Val Ala	Thr Glu Ser Ser Ala	Lys Thr Pro Ser
1565	1570	1575
Lys Leu Leu Asp Pro Leu	Ala Trp Asp Asn His	Tyr Gly Thr Gln
1580	1585	1590
Ile Pro Lys Glu Glu Trp	Lys Ser Gln Glu Lys	Ser Pro Glu Lys
1595	1600	1605
Thr Ala Phe Lys Lys Lys	Asp Thr Ile Leu Ser	Leu Asn Ala Cys
1610	1615	1620
Glu Ser Asn His Ala Ile	Ala Ala Ile Asn Glu	Gly Gln Asn Lys
1625	1630	1635
Pro Glu Ile Glu Val Thr	Trp Ala Lys Gln Gly	Arg Thr Glu Arg
1640	1645	1650
Leu Cys Ser Gln Asn Pro	Pro Val Leu Lys Arg	His Gln Arg Glu
1655	1660	1665
Ile Thr Arg Thr Thr Leu	Gln Ser Asp Gln Glu	Glu Ile Asp Tyr
1670	1675	1680
Asp Asp Thr Ile Ser Val	Glu Met Lys Lys Glu	Asp Phe Asp Ile
1685	1690	1695
Tyr Asp Glu Asp Glu Asn	Gln Ser Pro Arg Ser	Phe Gln Lys Lys
1700	1705	1710
Thr Arg His Tyr Phe Ile	Ala Ala Val Glu Arg	Leu Trp Asp Tyr
1715	1720	1725
Gly Met Ser Ser Ser Pro	His Val Leu Arg Asn	Arg Ala Gln Ser
1730	1735	1740
Gly Ser Val Pro Gln Phe	Lys Lys Val Val Phe	Gln Glu Phe Thr
1745	1750	1755

Asp	Gly	Ser	Phe	Thr	Gln	Pro	Leu	Tyr	Arg	Gly	Glu	Leu	Asn	Glu
1760						1765					1770			
His	Leu	Gly	Leu	Leu	Gly	Pro	Tyr	Ile	Arg	Ala	Glu	Val	Glu	Asp
1775						1780					1785			
Asn	Ile	Met	Val	Thr	Phe	Arg	Asn	Gln	Ala	Ser	Arg	Pro	Tyr	Ser
1790						1795					1800			
Phe	Tyr	Ser	Ser	Leu	Ile	Ser	Tyr	Glu	Glu	Asp	Gln	Arg	Gln	Gly
1805						1810					1815			
Ala	Glu	Pro	Arg	Lys	Asn	Phe	Val	Lys	Pro	Asn	Glu	Thr	Lys	Thr
1820						1825					1830			
Tyr	Phe	Trp	Lys	Val	Gln	His	His	Met	Ala	Pro	Thr	Lys	Asp	Glu
1835						1840					1845			
Phe	Asp	Cys	Lys	Ala	Trp	Ala	Tyr	Phe	Ser	Asp	Val	Asp	Leu	Glu
1850						1855					1860			
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1865						1870					1875			
Thr	Asn	Thr	Leu	Asn	Pro	Ala	His	Gly	Arg	Gln	Val	Thr	Val	Gln
1880						1885					1890			
Glu	Phe	Ala	Leu	Phe	Phe	Thr	Ile	Phe	Asp	Glu	Thr	Lys	Ser	Trp
1895						1900					1905			
Tyr	Phe	Thr	Glu	Asn	Met	Glu	Arg	Asn	Cys	Arg	Ala	Pro	Cys	Asn
1910						1915					1920			
Ile	Gln	Met	Glu	Asp	Pro	Thr	Phe	Lys	Glu	Asn	Tyr	Arg	Phe	His
1925						1930					1935			
Ala	Ile	Asn	Gly	Tyr	Ile	Met	Asp	Thr	Leu	Pro	Gly	Leu	Val	Met
1940						1945					1950			
Ala	Gln	Asp	Gln	Arg	Ile	Arg	Trp	Tyr	Leu	Leu	Ser	Met	Gly	Ser
1955						1960					1965			
Asn	Glu	Asn	Ile	His	Ser	Ile	His	Phe	Ser	Gly	His	Val	Phe	Thr
1970						1975					1980			
Val	Arg	Lys	Lys	Glu	Glu	Tyr	Lys	Met	Ala	Leu	Tyr	Asn	Leu	Tyr
1985						1990					1995			
Pro	Gly	Val	Phe	Glu	Thr	Val	Glu	Met	Leu	Pro	Ser	Lys	Ala	Gly
2000						2005					2010			
Ile	Trp	Arg	Val	Glu	Cys	Leu	Ile	Gly	Glu	His	Leu	His	Ala	Gly
2015						2020					2025			
Met	Ser	Thr	Leu	Phe	Leu	Val	Tyr	Ser	Asn	Lys	Cys	Gln	Thr	Pro
2030						2035					2040			
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<210> 31

&lt;211&gt; 1471

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 31

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&lt;210&gt; 32

&lt;211&gt; 461

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 32

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 Trp Ala Ala Ala His Ala Leu Pro Ala Gln Val Ala Phe Thr Pro Tyr  
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 Ala Pro Glu Pro Gly Ser Thr Cys Arg Leu Arg Glu Tyr Tyr Asp Gln  
 35 40 45  
 Thr Ala Gln Met Cys Cys Ser Lys Cys Ser Pro Gly Gln His Ala Lys  
 50 55 60  
 Val Phe Cys Thr Lys Thr Ser Asp Thr Val Cys Asp Ser Cys Glu Asp  
 65 70 75 80  
 Ser Thr Tyr Thr Gln Leu Trp Asn Trp Val Pro Glu Cys Leu Ser Cys  
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 Gly Ser Arg Cys Ser Ser Asp Gln Val Glu Thr Gln Ala Cys Thr Arg  
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 Glu Gln Asn Arg Ile Cys Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu  
 115 120 125  
 Ser Lys Gln Glu Gly Cys Arg Leu Cys Ala Pro Leu Arg Lys Cys Arg  
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 Pro Gly Phe Gly Val Ala Arg Pro Gly Thr Glu Thr Ser Asp Val Val  
 145 150 155 160  
 Cys Lys Pro Cys Ala Pro Gly Thr Phe Ser Asn Thr Thr Ser Ser Thr  
 165 170 175  
 Asp Ile Cys Arg Pro His Gln Ile Cys Asn Val Val Ala Ile Pro Gly  
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 Asn Ala Ser Met Asp Ala Val Cys Thr Ser Thr Ser Pro Thr Arg Ser  
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 Gln His Thr Gln Pro Thr Pro Glu Pro Ser Thr Ala Pro Ser Thr Ser  
 225 230 235 240  
 Phe Leu Leu Pro Met Gly Pro Ser Pro Pro Ala Glu Gly Ser Thr Gly  
 245 250 255  
 Asp Phe Ala Leu Pro Val Gly Leu Ile Val Gly Val Thr Ala Leu Gly  
 260 265 270  
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 Lys Lys Pro Leu Cys Leu Gln Arg Glu Ala Lys Val Pro His Leu Pro  
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 <212> PRT  
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 Cys Leu Asn Gly Gly Thr Cys Val Ser Asn Lys Tyr Phe Ser Asn Ile  
 35 40 45  
 His Trp Cys Asn Cys Pro Lys Lys Phe Gly Gly Gln His Cys Glu Ile  
 50 55 60  
 Asp Lys Ser Lys Thr Cys Tyr Glu Gly Asn Gly His Phe Tyr Arg Gly  
 65 70 75 80  
 Lys Ala Ser Thr Asp Thr Met Gly Arg Pro Cys Leu Pro Trp Asn Ser  
 85 90 95  
 Ala Thr Val Leu Gln Gln Thr Tyr His Ala His Arg Ser Asp Ala Leu  
 100 105 110  
 Gln Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Asn Arg  
 115 120 125  
 Arg Arg Pro Trp Cys Tyr Val Gln Val Gly Leu Lys Pro Leu Val Gln  
 130 135 140  
 Glu Cys Met Val His Asp Cys Ala Asp Gly Lys Lys Pro Ser Ser Pro  
 145 150 155 160  
 Pro Glu Glu Leu Lys Phe Gln Cys Gly Gln Lys Thr Leu Arg Pro Arg  
 165 170 175  
 Phe Lys Ile Ile Gly Gly Glu Phe Thr Thr Ile Glu Asn Gln Pro Trp

41

Tyr Ser Ala Ser Phe Leu Tyr Ser Gly Val Pro Ser Arg Phe Ser Gly  
 50 55 60

Ser Arg Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro  
 65 70 75 80

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 <211> 120  
 <212> PRT  
 <213> Mus musculus

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Tyr Ile His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
 35 40 45

Ala Arg Ile Tyr Pro Thr Asn Gly Tyr Thr Arg Tyr Ala Asp Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Ala Asp Thr Ser Lys Asn Thr Ala Tyr  
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
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Ser Arg Trp Gly Gly Asp Gly Phe Tyr Ala Met Asp Tyr Trp Gly Gln  
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Gly Thr Leu Val Thr Val Ser Ser  
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<210> 37  
 <211> 120  
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Gly Met Ser Val Gly Trp Ile Arg Gln Pro Ser Gly Lys Ala Leu Glu  
 35 40 45

Trp Leu Ala Asp Ile Trp Trp Asp Asp Lys Lys Asp Tyr Asn Pro Ser  
 50 55 60

Leu Lys Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val  
 65 70 75 80  
 Val Leu Lys Val Thr Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Tyr  
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 <212> PRT  
 <213> Mus musculus

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 Asp Arg Val Thr Ile Thr Cys Lys Cys Gln Leu Ser Val Gly Tyr Met  
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 His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Trp Ile Tyr  
 35 40 45  
 Asp Thr Ser Lys Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser  
 50 55 60  
 Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro Asp  
 65 70 75 80  
 Asp Phe Ala Thr Tyr Tyr Cys Phe Gln Gly Ser Gly Tyr Pro Phe Thr  
 85 90 95  
 Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
 100 105

<210> 39  
 <211> 1039  
 <212> DNA  
 <213> Homo sapiens

<400> 39  
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 cattctcgtc atctctgagg acatcaccat catctcagga tgaggggcat gaagctgctg 180  
 ggggcgctgc tggcactggc ggccctactg cagggggcgg tgtccctgaa gatcgagcc 240  
 ttcaacatcc agacatttgg ggagaccaag atgtccaatg ccaccctcgt cagctacatt 300  
 gtgcagatcc tgagccgcta tgacatcgcc ctgggtccagg aggtcagaga cageccacctg 360  
 actgccgtgg ggaagctgct ggacaacctc aatcaggatg caccagacac ctatcactac 420  
 gtgggtcagtg agccactggg acggaacagc tataaggagc gctacctgtt cgtgtacagg 480

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cctgaccagg tgtctgcggt ggacagctac tactacgatg atggctgcga gccctgcggg 540
aacgacacct tcaaccgaga gccagccatt gtcaggttct tctcccgggt cacagaggtc 600
agggagtttg ccattgttcc cctgcatgcg gccccggggg acgcagtagc cgagatcgac 660
gctctctatg acgtctacct ggatgtccaa gagaaatggg gcttgaggga cgtcatgttg 720
atggggcgact tcaatgcggg ctgcagctat gtgagaccct cccagtggtc atccatccgc 780
ctgtggacaa gccccacctt ccagtggctg atccccgaca gcgctgacac cacagctaca 840
cccacgcact gtgcctatga caggatcgtg gttgcaggga tgctgctccg aggcgcggtt 900
gttcccgact cggctcttcc ctttaacttc caggctgcct atggcctgag tgaccaactg 960
gccaagcca tcagtgacca ctatccagtg gaggtgatgc tgaagtgagc agcccctccc 1020
cacaccagtt gaactgcag 1039

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&lt;210&gt; 40

&lt;211&gt; 282

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 40

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Met Arg Gly Met Lys Leu Leu Gly Ala Leu Leu Ala Leu Ala Ala Leu
1          5          10          15

Leu Gln Gly Ala Val Ser Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr
20          25          30

Phe Gly Glu Thr Lys Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val
35          40          45

Gln Ile Leu Ser Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp
50          55          60

Ser His Leu Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp
65          70          75          80

Ala Pro Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn
85          90          95

Ser Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser
100         105         110

Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly Asn
115         120         125

Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser Arg Phe
130         135         140

Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala Ala Pro Gly
145         150         155         160

Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val Tyr Leu Asp Val
165         170         175

Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu Met Gly Asp Phe Asn
180         185         190

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Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln Trp Ser Ser Ile Arg Leu  
 195 200 205

Trp Thr Ser Pro Thr Phe Gln Trp Leu Ile Pro Asp Ser Ala Asp Thr  
 210 215 220

Thr Ala Thr Pro Thr His Cys Ala Tyr Asp Arg Ile Val Val Ala Gly  
 225 230 235 240

Met Leu Leu Arg Gly Ala Val Val Pro Asp Ser Ala Leu Pro Phe Asn  
 245 250 255

Phe Gln Ala Ala Tyr Gly Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser  
 260 265 270

Asp His Tyr Pro Val Glu Val Met Leu Lys  
 275 280

<210> 41  
 <211> 678  
 <212> DNA  
 <213> Mus musculus

<400> 41  
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 aatggttctc caaggcttct cataaagtat gttcttgagt ctatgtctgg gatcccttcc 180  
 aggttttagtg gcagtggatc agggacagat ttactctta gcatcaacac tgtggagtct 240  
 gaagatatcg cagattatta ctgtcaacaa agtcatagct ggccattcac gttcggctcg 300  
 gggacaaaatt tggaagtaaa agaagtgaag cttgaggagt ctggaggagg cttggtgcaa 360  
 cctggaggat ccatgaaact ctctgtgtt gcctctggat tcattttcag taaccaactgg 420  
 atgaactggg tccgccagtc tccagagaag gggcttgagt gggttgctga aattagatca 480  
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 agagatgatt ccaaaagtgc tgtctacctg caaatgaccg acttaagaac tgaagacact 600  
 ggcgtttatt actgttccag gaattactac ggtagtacct acgactactg gggccaaggc 660  
 accactctca cagtctcc 678

<210> 42  
 <211> 226  
 <212> PRT  
 <213> Mus musculus

<400> 42  
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Glu Arg Val Ser Phe Ser Cys Arg Ala Ser Gln Phe Val Gly Ser Ser  
 20 25 30

Ile His Trp Tyr Gln Gln Arg Thr Asn Gly Ser Pro Arg Leu Leu Ile  
 35 40 45

Lys Tyr Ala Ser Glu Ser Met Ser Gly Ile Pro Ser Arg Phe Ser Gly  
 50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Thr Val Glu Ser  
 65 70 75 80

Glu Asp Ile Ala Asp Tyr Tyr Cys Gln Gln Ser His Ser Trp Pro Phe  
 85 90 95

Thr Phe Gly Ser Gly Thr Asn Leu Glu Val Lys Glu Val Lys Leu Glu  
 100 105 110

Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Met Lys Leu Ser  
 115 120 125

Cys Val Ala Ser Gly Phe Ile Phe Ser Asn His Trp Met Asn Trp Val  
 130 135 140

Arg Gln Ser Pro Glu Lys Gly Leu Glu Trp Val Ala Glu Ile Arg Ser  
 145 150 155 160

Lys Ser Ile Asn Ser Ala Thr His Tyr Ala Glu Ser Val Lys Gly Arg  
 165 170 175

Phe Thr Ile Ser Arg Asp Asp Ser Lys Ser Ala Val Tyr Leu Gln Met  
 180 185 190

Thr Asp Leu Arg Thr Glu Asp Thr Gly Val Tyr Tyr Cys Ser Arg Asn  
 195 200 205

Tyr Tyr Gly Ser Thr Tyr Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr  
 210 215 220

Val Ser  
 225

<210> 43  
 <211> 450  
 <212> DNA  
 <213> Homo sapiens

<400> 43  
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 tgaaccaaca cctgtgcggc tcacacctgg tggaagctct ctacctagtg tgcggggaac 180  
 gaggcttctt ctacacaccc aagaccgcc gggaggcaga ggacctgcag gtggggcagg 240  
 tggagctggg cgggggccct ggtgcaggca gcctgcagcc cttggccctg gaggggtccc 300  
 tgcaagaagcg tggcattgtg gaacaatgct gtaccagcat ctgctccctc taccagctgg 360  
 agaactactg caactagacg cagcccgag gcagccccc acccgccgcc tctgcaccg 420  
 agagagatgg aataaagccc ttgaaccago 450

<210> 44  
 <211> 110  
 <212> PRT  
 <213> Homo sapiens

<400> 44  
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 20 25 30  
 Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe  
 35 40 45  
 Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly  
 50 55 60  
 Gln Val Glu Leu Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro Leu  
 65 70 75 80  
 Ala Leu Glu Gly Ser Leu Gln Lys Arg Gly Ile Val Glu Gln Cys Cys  
 85 90 95  
 Thr Ser Ile Cys Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Asn  
 100 105 110

<210> 45  
 <211> 1203  
 <212> DNA  
 <213> Hepatitis B virus

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 ccagattggg acttcaacc caacaaggat cactggccag aggcaatcaa ggtaggagcg 180  
 ggagacttgc ggccagggtt caccacacca cacggcggtc ttttggggtg gagccctcag 240  
 gctcagggca tattgacaac agtgccagca ggcctctc ctgtttccac caatggcag 300  
 tcaggaagac agcctactcc catctctcca cctctaagag acagtcattc tcaggccatg 360  
 cagtggaaact ccacaacatt ccaccaagct ctgctagatc ccagagtgag gggcctatat 420  
 tttcctgctg gtggctccag ttccggaaca gtaaaccctg ttccgactac tgtctcacc 480  
 atatcgtcaa tcttctcgag gactggggac cctgcaccga acatggagag cacaacatca 540  
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 acgtgtcctg gccaaaattc gcagtccca acctccaatc actcaccaac ctcttgctct 720  
 ccaatttgct ctggttatcg ctggatgtgt ctgcggtgtt ttatcatatt cctcttcac 780  
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tgctctctac ttccaggaac atcaactacc agcacgggac catgcaagac ctgcacgatt 900  
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 tgcacttgta ttcccatccc atcatcctgg gctttcgcaa gattcctatg ggagtgggcc 1020  
 tcagtcogtt tctcctgggt cagtttacta gtgccatttg ttcagtgggt cgcagggtt 1080  
 tccccactg tttggctttc agttatatgg atgatgtggt attgggggcc aagtctgtac 1140  
 aacatcttga gtcccttttt acctctatta ccaattttct tttgtctttg ggtatacatt 1200  
 tga 1203

<210> 46

<211> 400

<212> PRT

<213> Hepatitis B virus

<400> 46

Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn Leu  
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 Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro  
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 Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn  
 35 40 45  
 Lys Asp His Trp Pro Glu Ala Ile Lys Val Gly Ala Gly Asp Phe Gly  
 50 55 60  
 Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln  
 65 70 75 80  
 Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Val Ser  
 85 90 95  
 Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu  
 100 105 110  
 Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His  
 115 120 125  
 Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly  
 130 135 140  
 Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Val Ser Pro  
 145 150 155 160  
 Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu  
 165 170 175  
 Ser Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly  
 180 185 190  
 Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser  
 195 200 205  
 Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly  
 210 215 220

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro  
 225 230 235 240  
 Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile  
 245 250 255  
 Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu  
 260 265 270  
 Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser  
 275 280 285  
 Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly  
 290 295 300  
 Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn  
 305 310 315 320  
 Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu  
 325 330 335  
 Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro  
 340 345 350  
 Phe Val Gln Trp Phe Ala Gly Leu Ser Pro Thr Val Trp Leu Ser Val  
 355 360 365  
 Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser  
 370 375 380  
 Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile  
 385 390 395 400

<210> 47  
 <211> 799  
 <212> DNA  
 <213> Homo sapiens

<400> 47  
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 cccaaccatt cccttatcca ggccttttga caacgctatg ctccgcgcc atcgtctgca 180  
 ccagctggcc tttagacact accaggagtt tgaagaagcc tatatcccaa aggaacagaa 240  
 gtattcattc ctgcagaacc ccagacctc cctctgtttc tcagagtcta ttccgacacc 300  
 ctccaacagg gaggaacac aacagaaatc caacctagag ctgctccgca tctccctgct 360  
 gctcatccag tcgtggctgg agcccgtag gttcctcagg agtgtcttcg ccaacagcct 420  
 ggtgtacggc gcctctgaca gcaacgtcta tgacctcta aaggacctag aggaaggcat 480  
 ccaaacgctg atggggaggc tggaagatgg cagcccccg actgggcaga tcttcaagca 540  
 gacctacagc aagttcgaca caaactcaca caacgatgac gcactactca agaactacgg 600  
 gctgctctac tgcttcagga aggacatgga caaggctogag acattcctgc gcacgtgca 660

gtgccgctct gtggagggca gctgtggctt ctagctgcc cgggtggcatc cctgtgaccc 720  
 ctccccagtg cctctcctgg ccctggaagt tgccactcca gtgcccacca gccttgctct 780  
 aataaaatta agttgcatc 799

<210> 48  
 <211> 217  
 <212> PRT  
 <213> Homo sapiens

<400> 48  
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 Ser Arg Pro Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln  
 35 40 45  
 Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys  
 50 55 60  
 Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe  
 65 70 75 80  
 Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys  
 85 90 95  
 Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp  
 100 105 110  
 Leu Glu Pro Val Gln Phe Leu Arg Ser Val Phe Ala Asn Ser Leu Val  
 115 120 125  
 Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu  
 130 135 140  
 Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg  
 145 150 155 160  
 Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser  
 165 170 175  
 His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe  
 180 185 190  
 Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys  
 195 200 205  
 Arg Ser Val Glu Gly Ser Cys Gly Phe  
 210 215

<210> 49  
 <211> 963  
 <212> DNA  
 <213> Homo sapiens

<400> 49

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 gtcccgcccg agtgcttcga cctgctggtc cgcactgcg tggcctgcgg gctcctgcgc 180  
 acgcccgggc cgaaccggc cggggccagc agccctgcgc ccaggacggc gctgcagccg 240  
 caggagtcgg tgggcgcggg gccggcgag gcggcggtcg aaaaaactca cacatgccca 300  
 ccgtgccag cacctgaact cctgggggga ccgtcagtct tcctcttccc cccaaaaccc 360  
 aaggacaccc tcatgatctc ccggaccct gaggtcacat gcgtgggtgt ggacgtgagc 420  
 cacgaagacc ctgaggtcaa gttcaactgg tacgtggacg gcgtggaggt gcataatgcc 480  
 aagacaaagc cgcgggagga gcagtacaac agcacgtacc gtgtggtcag cgtcctcacc 540  
 gtctgcacc aggactggct gaatggcaag gagtacaagt gcaaggtctc caacaaagcc 600  
 ctcccagccc ccatcgagaa aaccatctcc aaagccaaag ggcagccccg agaaccacag 660  
 gtgtacaccc tgccccatc ccgggatgag ctgaccaaga accaggtcag cctgacctgc 720  
 ctgggtcaaag gcttctatcc cagcgacatc gccgtggagt gggagagcaa tgggcagccg 780  
 gagaacaact acaagaccac gcctcccggtg ttggactccg acggtctctt ctctctctac 840  
 agcaagctca ccgtggacaa gagcaggtgg cagcagggga acgtcttctc atgctccgtg 900  
 atgcatgagg ctctgcacaa ccactacacg cagaagagcc tctccctgtc tcccgggaaa 960  
 tga 963

<210> 50  
 <211> 320  
 <212> PRT  
 <213> Homo sapiens

<400> 50  
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 Gly Ser Thr Gly Asp Val Arg Arg Gly Pro Arg Ser Leu Arg Gly Arg  
 20 25 30  
 Asp Ala Pro Ala Pro Thr Pro Cys Val Pro Ala Glu Cys Phe Asp Leu  
 35 40 45  
 Leu Val Arg His Cys Val Ala Cys Gly Leu Leu Arg Thr Pro Arg Pro  
 50 55 60  
 Lys Pro Ala Gly Ala Ser Ser Pro Ala Pro Arg Thr Ala Leu Gln Pro  
 65 70 75 80  
 Gln Glu Ser Val Gly Ala Gly Ala Gly Glu Ala Ala Val Asp Lys Thr  
 85 90 95  
 His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser  
 100 105 110

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg  
 115 120 125  
 Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro  
 130 135 140  
 Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala  
 145 150 155 160  
 Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val  
 165 170 175  
 Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr  
 180 185 190  
 Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr  
 195 200 205  
 Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu  
 210 215 220  
 Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys  
 225 230 235 240  
 Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser  
 245 250 255  
 Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp  
 260 265 270  
 Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser  
 275 280 285  
 Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala  
 290 295 300  
 Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys  
 305 310 315 320  
 <210> 51  
 <211> 107  
 <212> PRT  
 <213> Homo sapiens  
 <400> 51  
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 Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile  
 35 40 45  
 Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly  
 50 55 60  
 Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro  
 65 70 75 80  
 Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp

85 90 95  
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 <211> 107  
 <212> PRT  
 <213> Mus musculus  
 <400> 52  
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 Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Ile Val Lys Leu Leu Ile  
 35 40 45  
 Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly  
 50 55 60  
 Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln  
 65 70 75 80  
 Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp  
 85 90 95  
 Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
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 <210> 53  
 <211> 119  
 <212> PRT  
 <213> Homo sapiens  
 <400> 53  
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 20 25 30  
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 35 40 45  
 Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe  
 50 55 60  
 Lys Gly Arg Val Thr Leu Thr Val Asp Glu Ser Thr Asn Thr Ala Tyr  
 65 70 75 80  
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Phe Cys  
 85 90 95  
 Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly  
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 Thr Leu Val Thr Val Ser Ser  
 115

<210> 54  
 <211> 119  
 <212> PRT  
 <213> Mus musculus

<400> 54  
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 20 25 30  
 Leu Ile Glu Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile  
 35 40 45  
 Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe  
 50 55 60  
 Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Thr Thr Ala Tyr  
 65 70 75 80  
 Met Gln Leu Ser Ser Leu Thr Ser Asp Asp Ser Ala Val Tyr Phe Cys  
 85 90 95  
 Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Arg Gly  
 100 105 110  
 Thr Leu Val Thr Val Ser Ala  
 115

<210> 55  
 <211> 214  
 <212> PRT  
 <213> Homo sapiens

<400> 55  
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 Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile  
 35 40 45  
 Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly  
 50 55 60  
 Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro  
 65 70 75 80  
 Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp  
 85 90 95  
 Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys Arg Thr Val Ala Ala  
 100 105 110  
 Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly  
 115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala  
 130 135 140  
 Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln  
 145 150 155 160  
 Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser  
 165 170 175  
 Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr  
 180 185 190  
 Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser  
 195 200 205  
 Phe Asn Arg Gly Glu Cys  
 210  
 <210> 56  
 <211> 448  
 <212> PRT  
 <213> Homo sapiens  
 <400> 56  
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser  
 1 5 10 15  
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&lt;213&gt; Homo sapiens

&lt;400&gt; 65

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 ctgttgcgca agccggtgct cacggccatg gggctgctgg cgctgctgga tgaggagcag 1200  
 ctctgggccg aagtgtcgca ggccgggacc gtcttgga gcaaccacac ggtggcgctc 1260  
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 tacgcgagcg acgacacccg cgccacccc aaccgcagcg tcgcggtgac cctgcggctg 1380  
 cgcgggggtgc ccccgggccc gggcctggtc tacgtcacgc gctacctgga caacgggctc 1440  
 tgcagccccg acggcgagtg gcggcgccct ggccggcccg tcttccccac ggcagagcag 1500  
 ttccggcgca tgcgcgcggc tgaggacccg gtggccgcgg cgcggcgccc cttaccgcgc 1560  
 ggcggccgcc tgaccctgcg ccccgcgctg cggtgcctg cgcttttctt ggtgcacgtg 1620  
 tgtgcgcgcc ccgagaagcc gcccgggcag gtcaacgcgc tcgcgcctt gccctgacc 1680  
 caagggcagc tggttcttgg ctggtcggat gaacacgtgg gctccaagt cctgtggaca 1740  
 tacgagatcc agttctctca ggacggtaag gcgtacacc cggtcagcag gaagccatcg 1800  
 accttcaacc totttgtgtt cagcccagac acaggtgctg tctctggctc ctaccgagtt 1860  
 cgagccctgg actactgggc ccgaccaggc cccttctcgg accctgtgcc gtacctggag 1920  
 gtccctgtgc caagagggcc cccatccccg ggcaatccat ga 1962

<210> 66  
 <211> 653  
 <212> PRT  
 <213> Homo sapiens

<400> 66

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Met Arg Pro Leu Arg Pro Arg Ala Ala Leu Leu Ala Leu Leu Ala Ser
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Leu Leu Ala Ala Pro Pro Val Ala Pro Ala Glu Ala Pro His Leu Val
          20          25          30

Gln Val Asp Ala Ala Arg Ala Leu Trp Pro Leu Arg Arg Phe Trp Arg
          35          40          45

Ser Thr Gly Phe Cys Pro Pro Leu Pro His Ser Gln Ala Asp Gln Tyr
          50          55          60

Val Leu Ser Trp Asp Gln Gln Leu Asn Leu Ala Tyr Val Gly Ala Val
65          70          75          80

Pro His Arg Gly Ile Lys Gln Val Arg Thr His Trp Leu Leu Glu Leu
          85          90          95

Val Thr Thr Arg Gly Ser Thr Gly Arg Gly Leu Ser Tyr Asn Phe Thr
          100          105          110

His Leu Asp Gly Tyr Leu Asp Leu Leu Arg Glu Asn Gln Leu Leu Pro
          115          120          125

Gly Phe Glu Leu Met Gly Ser Ala Ser Gly His Phe Thr Asp Phe Glu
          130          135          140

Asp Lys Gln Gln Val Phe Glu Trp Lys Asp Leu Val Ser Ser Leu Ala
145          150          155          160

Arg Arg Tyr Ile Gly Arg Tyr Gly Leu Ala His Val Ser Lys Trp Asn
          165          170          175

Phe Glu Thr Trp Asn Glu Pro Asp His His Asp Phe Asp Asn Val Ser
          180          185          190

Met Thr Met Gln Gly Phe Leu Asn Tyr Tyr Asp Ala Cys Ser Glu Gly
          195          200          205

Leu Arg Ala Ala Ser Pro Ala Leu Arg Leu Gly Gly Pro Gly Asp Ser
          210          215          220

Phe His Thr Pro Pro Arg Ser Pro Leu Ser Trp Gly Leu Leu Arg His
225          230          235          240

Cys His Asp Gly Thr Asn Phe Phe Thr Gly Glu Ala Gly Val Arg Leu
          245          250          255

Asp Tyr Ile Ser Leu His Arg Lys Gly Ala Arg Ser Ser Ile Ser Ile
          260          265          270

Leu Glu Gln Glu Lys Val Val Ala Gln Gln Ile Arg Gln Leu Phe Pro
          275          280          285

Lys Phe Ala Asp Thr Pro Ile Tyr Asn Asp Glu Ala Asp Pro Leu Val

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290					295					300					
Gly	Trp	Ser	Leu	Pro	Gln	Pro	Trp	Arg	Ala	Asp	Val	Thr	Tyr	Ala	Ala
305					310					315					320
Met	Val	Val	Lys	Val	Ile	Ala	Gln	His	Gln	Asn	Leu	Leu	Leu	Ala	Asn
				325					330					335	
Thr	Thr	Ser	Ala	Phe	Pro	Tyr	Ala	Leu	Leu	Ser	Asn	Asp	Asn	Ala	Phe
			340					345					350		
Leu	Ser	Tyr	His	Pro	His	Pro	Phe	Ala	Gln	Arg	Thr	Leu	Thr	Ala	Arg
		355					360					365			
Phe	Gln	Val	Asn	Asn	Thr	Arg	Pro	Pro	His	Val	Gln	Leu	Leu	Arg	Lys
	370					375					380				
Pro	Val	Leu	Thr	Ala	Met	Gly	Leu	Leu	Ala	Leu	Leu	Asp	Glu	Glu	Gln
385					390					395					400
Leu	Trp	Ala	Glu	Val	Ser	Gln	Ala	Gly	Thr	Val	Leu	Asp	Ser	Asn	His
				405				410						415	
Thr	Val	Gly	Val	Leu	Ala	Ser	Ala	His	Arg	Pro	Gln	Gly	Pro	Ala	Asp
			420					425					430		
Ala	Trp	Arg	Ala	Ala	Val	Leu	Ile	Tyr	Ala	Ser	Asp	Asp	Thr	Arg	Ala
		435					440					445			
His	Pro	Asn	Arg	Ser	Val	Ala	Val	Thr	Leu	Arg	Leu	Arg	Gly	Val	Pro
		450				455					460				
Pro	Gly	Pro	Gly	Leu	Val	Tyr	Val	Thr	Arg	Tyr	Leu	Asp	Asn	Gly	Leu
465					470					475					480
Cys	Ser	Pro	Asp	Gly	Glu	Trp	Arg	Arg	Leu	Gly	Arg	Pro	Val	Phe	Pro
				485					490					495	
Thr	Ala	Glu	Gln	Phe	Arg	Arg	Met	Arg	Ala	Ala	Glu	Asp	Pro	Val	Ala
			500					505					510		
Ala	Ala	Pro	Arg	Pro	Leu	Pro	Ala	Gly	Gly	Arg	Leu	Thr	Leu	Arg	Pro
		515					520					525			
Ala	Leu	Arg	Leu	Pro	Ser	Leu	Leu	Leu	Val	His	Val	Cys	Ala	Arg	Pro
	530					535					540				
Glu	Lys	Pro	Pro	Gly	Gln	Val	Thr	Arg	Leu	Arg	Ala	Leu	Pro	Leu	Thr
545					550					555					560
Gln	Gly	Gln	Leu	Val	Leu	Val	Trp	Ser	Asp	Glu	His	Val	Gly	Ser	Lys
				565					570					575	
Cys	Leu	Trp	Thr	Tyr	Glu	Ile	Gln	Phe	Ser	Gln	Asp	Gly	Lys	Ala	Tyr
			580					585					590		
Thr	Pro	Val	Ser	Arg	Lys	Pro	Ser	Thr	Phe	Asn	Leu	Phe	Val	Phe	Ser
		595					600					605			
Pro	Asp	Thr	Gly	Ala	Val	Ser	Gly	Ser	Tyr	Arg	Val	Arg	Ala	Leu	Asp
	610					615					620				

Tyr Trp Ala Arg Pro Gly Pro Phe Ser Asp Pro Val Pro Tyr Leu Glu  
 625 630 635 640

Val Pro Val Pro Arg Gly Pro Pro Ser Pro Gly Asn Pro  
 645 650

<210> 67  
 <211> 1290  
 <212> DNA  
 <213> Homo sapiens

<400> 67  
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 accatgggct ggctgcactg ggagcgcttc atgtgcaacc ttgactgcca ggaagagcca 180  
 gattcctgca tcagtgagaa gctcttcatg gagatggcag agctcatggt ctccagaaggc 240  
 tggaaggatg caggttatga gtacctctgc attgatgact gttggatggc tccccaaaga 300  
 gattcagaag gcagacttca ggcagaccct cagcgctttc ctcatgggat tcgccagcta 360  
 gctaattatg ttcacagcaa aggaactgaag ctagggattt atgcagatgt tggaaataaa 420  
 acctgcgcag gcttccctgg gagttttgga tactacgaca ttgatgcca gacctttgct 480  
 gactggggag tagatctgct aaaatttgat ggttggtact gtgacagttt ggaaaatttg 540  
 gcagatgggt ataagcacat gtccttggcc ctgaatagga ctggcagaag cattgtgtac 600  
 tcctgtgagt ggctcttcta tatgtggccc tttaaaaagc ccaattatac agaaatccga 660  
 cagtactgca atcactggcg aaattttgct gacattgatg attcctggaa aagtataaag 720  
 agtatcttgg actggacatc ttttaaccag gagagaattg ttgatgttgc tggaccaggg 780  
 ggttggaatg acccagatat gttagtgatt ggcaactttg gcctcagctg gaatcagcaa 840  
 gtaactcaga tggccctctg ggctatcatg gctgctcctt tattcatgtc taatgacctc 900  
 cgacacatca gccctcaagc caaagctctc cttcaggata aggacgtaat tgccatcaat 960  
 caggaccctt tgggcaagca agggtagcag cttagacagg gagacaactt tgaagtgtgg 1020  
 gaacgacctc tctcaggctt agcctgggct gtagctatga taaaccggca ggagattggg 1080  
 ggacctcgct cttataccat cgcagttgct tccctgggta aaggagtggc ctgtaatcct 1140  
 gcctgcttca tcacacagct cctccctgtg aaaaggaagc tagggttcta tgaatggact 1200  
 tcaagggttaa gaagtcacat aaatcccaca ggcactgttt tgcttcagct agaaaataca 1260  
 atgcagatgt cattaaaaga cttactttta 1290

<210> 68  
 <211> 429  
 <212> PRT  
 <213> Homo sapiens

&lt;400&gt; 68

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Met Gln Leu Arg Asn Pro Glu Leu His Leu Gly Cys Ala Leu Ala Leu
1           5           10           15

Arg Phe Leu Ala Leu Val Ser Trp Asp Ile Pro Gly Ala Arg Ala Leu
          20           25           30

Asp Asn Gly Leu Ala Arg Thr Pro Thr Met Gly Trp Leu His Trp Glu
          35           40           45

Arg Phe Met Cys Asn Leu Asp Cys Gln Glu Glu Pro Asp Ser Cys Ile
          50           55           60

Ser Glu Lys Leu Phe Met Glu Met Ala Glu Leu Met Val Ser Glu Gly
65           70           75           80

Trp Lys Asp Ala Gly Tyr Glu Tyr Leu Cys Ile Asp Asp Cys Trp Met
          85           90           95

Ala Pro Gln Arg Asp Ser Glu Gly Arg Leu Gln Ala Asp Pro Gln Arg
          100          105          110

Phe Pro His Gly Ile Arg Gln Leu Ala Asn Tyr Val His Ser Lys Gly
          115          120          125

Leu Lys Leu Gly Ile Tyr Ala Asp Val Gly Asn Lys Thr Cys Ala Gly
130           135           140

Phe Pro Gly Ser Phe Gly Tyr Tyr Asp Ile Asp Ala Gln Thr Phe Ala
145           150           155           160

Asp Trp Gly Val Asp Leu Leu Lys Phe Asp Gly Cys Tyr Cys Asp Ser
          165          170          175

Leu Glu Asn Leu Ala Asp Gly Tyr Lys His Met Ser Leu Ala Leu Asn
          180          185          190

Arg Thr Gly Arg Ser Ile Val Tyr Ser Cys Glu Trp Pro Leu Tyr Met
          195          200          205

Trp Pro Phe Gln Lys Pro Asn Tyr Thr Glu Ile Arg Gln Tyr Cys Asn
210           215           220

His Trp Arg Asn Phe Ala Asp Ile Asp Asp Ser Trp Lys Ser Ile Lys
225           230           235           240

Ser Ile Leu Asp Trp Thr Ser Phe Asn Gln Glu Arg Ile Val Asp Val
          245          250          255

Ala Gly Pro Gly Gly Trp Asn Asp Pro Asp Met Leu Val Ile Gly Asn
          260          265          270

Phe Gly Leu Ser Trp Asn Gln Gln Val Thr Gln Met Ala Leu Trp Ala
          275          280          285

Ile Met Ala Ala Pro Leu Phe Met Ser Asn Asp Leu Arg His Ile Ser
          290          295          300

Pro Gln Ala Lys Ala Leu Leu Gln Asp Lys Asp Val Ile Ala Ile Asn
305           310           315           320

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Gln Asp Pro Leu Gly Lys Gln Gly Tyr Gln Leu Arg Gln Gly Asp Asn  
 325 330 335

Phe Glu Val Trp Glu Arg Pro Leu Ser Gly Leu Ala Trp Ala Val Ala  
 340 345 350

Met Ile Asn Arg Gln Glu Ile Gly Gly Pro Arg Ser Tyr Thr Ile Ala  
 355 360 365

Val Ala Ser Leu Gly Lys Gly Val Ala Cys Asn Pro Ala Cys Phe Ile  
 370 375 380

Thr Gln Leu Leu Pro Val Lys Arg Lys Leu Gly Phe Tyr Glu Trp Thr  
 385 390 395 400

Ser Arg Leu Arg Ser His Ile Asn Pro Thr Gly Thr Val Leu Leu Gln  
 405 410 415

Leu Glu Asn Thr Met Gln Met Ser Leu Lys Asp Leu Leu  
 420 425

<210> 69  
 <211> 351  
 <212> DNA  
 <213> Homo sapiens

<400> 69  
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 ttctttctccc agccgggtgc cccaatactt cagtgcattgg gctgctgctt ctctagagca 180  
 tatccacttc cactaaggtc caagaagacg atgttggtcc aaaagaacgt cacctcagag 240  
 tccacttgct gtgtagctaa atcatataac agggtcacag taatgggggg tttcaaagtg 300  
 gagaaccaca cggcgtgcc aatgcagtact tgttattatc acaaattotta a 351

<210> 70  
 <211> 116  
 <212> PRT  
 <213> Homo sapiens

<400> 70  
 Met Asp Tyr Tyr Arg Lys Tyr Ala Ala Ile Phe Leu Val Thr Leu Ser  
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 Val Phe Leu His Val Leu His Ser Ala Pro Asp Val Gln Asp Cys Pro  
 20 25 30  
 Glu Cys Thr Leu Gln Glu Asn Pro Phe Phe Ser Gln Pro Gly Ala Pro  
 35 40 45  
 Ile Leu Gln Cys Met Gly Cys Cys Phe Ser Arg Ala Tyr Pro Thr Pro  
 50 55 60  
 Leu Arg Ser Lys Lys Thr Met Leu Val Gln Lys Asn Val Thr Ser Glu  
 65 70 75 80

Ser Thr Cys Cys Val Ala Lys Ser Tyr Asn Arg Val Thr Val Met Gly  
                             85                            90                            95

Gly Phe Lys Val Glu Asn His Thr Ala Cys His Cys Ser Thr Cys Tyr  
                             100                            105                            110

Tyr His Lys Ser  
                             115

<210> 71  
 <211> 498  
 <212> DNA  
 <213> Homo sapiens

<400> 71  
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 tccaaggagc cgcttcggcc acggtgccgc cccatcaatg ccaccctggc tgtggagaag 120  
 gagggctgcc ccgtgtgcat caccgtcaac accaccatct gtgccggcta ctgccccacc 180  
 atgacccgag tgctgcaggg ggtcctgccg gccctgcctc aggtggtgtg caactaccgc 240  
 gatgtgogct tcgagtcctt ccggctccct ggctgccgcg gcggcgtgaa ccccggtggc 300  
 tcctacgcgc tggtctcag ctgtcaatgt gcaactctgcc gccgcagcac cactgactgc 360  
 ggggggtcca aggaccacc cttgacctgt gatgaccccc gcttcaggga ctctctctcc 420  
 tcaaaggccc ctccccccag ccttccaagc ccatcccgac tcccggggcc ctcggaacacc 480  
 ccgatacctcc cacaataa 498

<210> 72  
 <211> 165  
 <212> PRT  
 <213> Homo sapiens

<400> 72  
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 Gly Thr Trp Ala Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile  
                             20                            25                            30  
 Asn Ala Thr Leu Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr  
                             35                            40                            45  
 Val Asn Thr Thr Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val  
                             50                            55                            60  
 Leu Gln Gly Val Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg  
 65                            70                            75                            80  
 Asp Val Arg Phe Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val  
                             85                            90                            95  
 Asn Pro Val Val Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu  
                             100                            105                            110  
 Cys Arg Arg Ser Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu

115                      120                      125  
 Thr Cys Asp Asp Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro  
     130                      135                      140  
 Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr  
 145                      150                      155                      160  
 Pro Ile Leu Pro Gln  
                          165

<210> 73  
 <211> 165  
 <212> PRT  
 <213> Homo sapiens

<400> 73  
 Ala Pro Pro Arg Leu Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu  
 1                      5                      10                      15  
 Leu Glu Ala Lys Glu Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His  
                     20                      25                      30  
 Cys Ser Leu Asn Glu Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe  
                     35                      40                      45  
 Tyr Ala Trp Lys Arg Met Glu Val Gly Gln Gln Ala Val Glu Val Trp  
                     50                      55                      60  
 Gln Gly Leu Ala Leu Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu  
 65                      70                      75                      80  
 Leu Val Asn Ser Ser Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp  
                     85                      90                      95  
 Lys Ala Val Ser Gly Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu  
                     100                      105                      110  
 Gly Ala Gln Lys Glu Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala  
                     115                      120                      125  
 Pro Leu Arg Thr Ile Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val  
                     130                      135                      140  
 Tyr Ser Asn Phe Leu Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala  
 145                      150                      155                      160  
 Cys Arg Thr Gly Asp  
                          165

<210> 74  
 <211> 588  
 <212> DNA  
 <213> Homo sapiens

<400> 74  
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 ctgcacaaaa tgaggagaat ctcccttttc ttgtgtotca aggacagaag agacttcagg 180

ttccccagg agatggtaaa agggagccag ttgcagaagg cccatgtcat gtctgtcctc 240  
 catgagatgc tgcagcagat cttcagcctc ttccacacag agogetcctc tgctgcctgg 300  
 aacatgaccc tcctagacca actccacact ggacttcata agcaactgca acacctggag 360  
 acctgcttgc tgcaggtagt gggagaagga gaatctgctg gggcaattag cagccctgca 420  
 ctgaccttga ggaggtactt ccaggaatc cgtgtctacc tgaaagagaa gaaatacagc 480  
 gactgtgcct gggaagttgt cagaatggaa atcatgaaat ccttggttctt atcaacaaac 540  
 atgcaagaaa gactgagaag taaagataga gacctgggct catcttga 588

<210> 75  
 <211> 195  
 <212> PRT  
 <213> Homo sapiens

<400> 75  
 Met Ala Leu Leu Phe Pro Leu Leu Ala Ala Leu Val Met Thr Ser Tyr  
 1 5 10 15  
 Ser Pro Val Gly Ser Leu Gly Cys Asp Leu Pro Gln Asn His Gly Leu  
 20 25 30  
 Leu Ser Arg Asn Thr Leu Val Leu Leu His Gln Met Arg Arg Ile Ser  
 35 40 45  
 Pro Phe Leu Cys Leu Lys Asp Arg Arg Asp Phe Arg Phe Pro Gln Glu  
 50 55 60  
 Met Val Lys Gly Ser Gln Leu Gln Lys Ala His Val Met Ser Val Leu  
 65 70 75 80  
 His Glu Met Leu Gln Gln Ile Phe Ser Leu Phe His Thr Glu Arg Ser  
 85 90 95  
 Ser Ala Ala Trp Asn Met Thr Leu Leu Asp Gln Leu His Thr Gly Leu  
 100 105 110  
 His Gln Gln Leu Gln His Leu Glu Thr Cys Leu Leu Gln Val Val Gly  
 115 120 125  
 Glu Gly Glu Ser Ala Gly Ala Ile Ser Ser Pro Ala Leu Thr Leu Arg  
 130 135 140  
 Arg Tyr Phe Gln Gly Ile Arg Val Tyr Leu Lys Glu Lys Lys Tyr Ser  
 145 150 155 160  
 Asp Cys Ala Trp Glu Val Val Arg Met Glu Ile Met Lys Ser Leu Phe  
 165 170 175  
 Leu Ser Thr Asn Met Gln Glu Arg Leu Arg Ser Lys Asp Arg Asp Leu  
 180 185 190  
 Gly Ser Ser  
 195